

SECOND SERIES

VOL. VIII, No. 2

BULLETIN
OF
THE NEW YORK
ACADEMY OF MEDICINE



FEBRUARY, 1932

PUBLISHED MONTHLY BY

THE NEW YORK ACADEMY OF MEDICINE

Fifth Avenue and 103rd Street
New York, N. Y.

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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VIII

JANUARY, 1932

No. 1

ANNIVERSARY DISCOURSE THE UNIVERSITY AND THE MEDICAL PROFESSION*

JAMES L. LIND

Professor of Pathology, Cornell University Medical College

The University has always been the best expression of the intelligence of a community. The remarkable achievements of ancient peoples indicate that they enjoyed some of the advantages of the University idea long before any formal organization existed. Ancient Greece, in the time of Pericles, 460-136 B. C. produced the most remarkable galaxy of great names of any age in history. Plato, Socrates, Aristotle, Hippocrates frequented the Academy at Athens as individuals and taught whom and what they chose. Modern educators who are concerned about developing the best product may well ponder the fact that Greece accomplished her results without complex organization or great material resources, but certainly not without method.

Since there were no books and few parchment scrolls, the method involved disputations, lectures, and close personal contacts. They developed to the highest degree the spoken word, so that Greek became the most elegant and refined of all languages. We may well believe that the Greek scholars became most impressive personalities, able to sway their pupils by the force of logic and oratory and

*Delivered before The New York Academy of Medicine, November 3, 1931.

probably also by nobility of character. It is very important to note that Medicine occupied a very high, possibly the highest position in the learning of that early day. The writings of Hippocrates stand as scholarly productions even today, and represent an enormous labor guided by high intelligence. Yet, his greatest contribution was the code of morals, necessarily reflecting the general standards of the time, and still, after 2,400 years, testing the moral capacity of present day physicians. We must confess that the ancient Greeks conceived the University idea in its simplest and most effective form. They relied upon individuality, simplicity, and refinement of thought and speech. They were also good observers, for Aristotle gave to Medicine the beginnings of comparative anatomy, botany, zoology, embryology, and physiology, and Garrison regards him as the greatest biologist of antiquity with an influence extending down to modern times.

It has been said that the first essential of a University is a great library. Some would place the first real University at Alexandria where Greek culture was grafted upon an ancient civilization and where a great library and storehouse of knowledge was accumulated. It is true that the Alexandrians especially Herophilus and Erisistratus, anatomist and physiologist, carried Medicine further than the Greeks, but the inspiration was still mainly Grecian. Those who wish may attribute this success to the great library.

The austere Romans long rejected Greek medicine because of its dogmas, empiricism, and commercialism, but after the destruction of Corinth B. C. 124, it was introduced into Rome mainly through the influence of Asclepiades. He was a strong personality, but, as a scientist, he was less sound than Hippocrates. In the early Roman Empire, it is difficult to find any evidence of full appreciation of the University idea, although medicine, hygiene, and sanitary engineering became prominent interests of the State, and objects of patronage by the emperors. Men of learning seem to have wandered about as individ-

uals, attracting followers according to their personalities, memorizing the texts of ancient writers, disputing about theories, and indulging their own speculations without much reference to new facts.

Supported by a rich clientele, practical medicine, however seems to have developed to a rather high degree, and it is not improbable that in the Roman Empire the available knowledge of the day was as well applied to practical uses and abuses as it is today. Over two hundred surgical instruments were found at Pompeii.

Roman medicine produced many great scholars, generally under the patronage of the emperors, but apparently not aided by University ideals or organization. Celsus was a rich Roman gentleman in the time of Tiberius, a polished writer, a student of medical history, a rather astute medical philosopher who compiled or translated treatises on nearly every department of medicine, which remained standard for centuries and were eventually printed in 1468. He was a modern Hippocrates. Dioscorides, an army physician under Nero (54-68 A. D.), was virtually the originator of *materia medica*, describing several hundred vegetable plants and principles. His work remained the chief source of information until the 17th century. Soranus of Ephesus, in the 2nd Century, compiled a treatise on obstetrics, gynecology and pediatrics, to which no important additions were made until the time of Paré, 1500 years later.

Galen, 131-201 A. D. was undoubtedly the most influential character in ancient medicine. He was a highly talented, very industrious scientific adventurer, who wrote enormous treatises on every department of medicine. He was first an aggressive, self-confident, and highly successful practitioner. His great power lay in his remarkable studies and demonstrations in experimental physiology of the nervous and vascular systems in which he made important original contributions. By indefatigable industry he produced an encyclopedia of medicine in which fact

and fancy were so cleverly intermingled that the work became the authoritative medical gospel and so remained for a thousand years. His theorizing was almost wholly immature and unsound, utterly unwarranted by the available knowledge and strictly designed to maintain the teleological idea of natural processes. His career is the outstanding example in the history of science that man is, on the whole, a poor thinker, but a marvellous doer. Who can say whether medicine would have done better if Galen had never lived?

Finally, in the Roman Empire it should be noted Medicine became of vast importance in the social life. Practitioners were numerous, specialists of all sorts abounded, medical cults flourished; sorcerers, poisoners, charlatans of every type mingled without restraint of law, with reputable physicians. Disease was excessively common, and the State, apparently despairing of any great aid from curative medicine, devoted itself with astonishing success to personal hygiene and to public works calling for the highest degree of skill in sanitary engineering. And thus Roman medicine continued for about 500 years, until advancing physical and moral decay led to the disintegration of the Empire.

To the student of the university idea, the history of Roman Medicine offers many lessons of importance. Although the Romans had a genius for organization and the making of laws they did not apply this genius to Medicine. They got along 600 years without doctors and after the introduction of Greek medicine they continued 500 years more without any real conception of the university idea. Individual talent was abundant enough, but the conception that systematic coöperative intelligence properly organized and directed to the collection, spread, and increase of knowledge was a necessary feature of a stable civilization seemed not to enter their heads. Schools of some sorts and opportunities for acquiring medical and other knowledge must have existed, but the teaching of science was mainly practical and under the apprentice-

ship system. We know of no great collections of scholars, libraries, or students such as existed at Athens, Alexandria, and Ephesus. The great Roman physicians seem to have lacked the moral fibre of the Greeks. It is easy to see how the rare and expensive parchments executed by hand with extreme care became very precious documents, which were available to the select few. So the Canons of Hippocrates, Galen and Avicenna became the gospels of medicine, and the scholar's position depended largely upon the extent of his familiarity with these gospels, and his ability to maintain any thesis by quotations from these and other reputed writings. The Romans studied mainly books, not Nature.

With the breaking up of the Western Empire conditions completely changed for the worse. The destructive invasions from the North removed most vestiges of organized medical science and practice, and science and learning took refuge in the Church, where they remained for over 600 years. The monks did not do any too well with their responsibilities, owing partly to chaotic political conditions, but they preserved and cherished the Greco-Roman parchments and they devoted themselves seriously to the care of the sick. In 480-544 A. D. they founded the Benedictine Order devoted mainly to medical interests and nursing. They Latinized medical writings and civilized to some extent the northern invaders. Monastic medicine was probably about as good as conditions permitted. Yet in the cloisters with attached hospitals there were excellent opportunities for original thought and observation, and even for university coöperation, of which this entire era produced nothing. Instead, the amazing history of science in the Dark Ages was a vast experiment revealing the baleful influence of the worship of authority and the pursuit of scholasticism. Nearly all the influences were antagonistic to the university spirit.

But original thought was not dead. It had survived best under Moslem influence, and in 1020-84 A. D. it led suddenly to the foundation of a vigorous school of medi-

cine at Salerno. Here, under Constantine, a native of Carthage, gathered a group of scholars, who pursued with original freshness, anatomy, physiology, internal medicine, surgery, and with the aid of women, obstetrics and nursing. They produced a great encyclopedia of medicine, written by many authors, the *Summa medicinalis* of Salerno, which became the standard text-book for a century or more.

The foundation of the mediæval universities followed rapidly after the example of Salerno, at Paris, 1140; Bologna, 1158; Oxford, 1167. The beginnings of some of these schools were probably laid much earlier for Oxford ventured to celebrate its 1000th anniversary in 1872. Within a period of 200 years substantial university organizations were built up over the whole of Europe from Scotland to Bagdad. At first the main objects pursued were medical, but very soon, law, philosophy, theology, and the natural sciences became almost equally prominent. At this critical period probably more than ever before, medicine revealed itself as the mother of the sciences, and the physician became recognized as a member of a learned profession.

The early recruits of medicine came largely from the monks and friars, but soon the dissemination of knowledge brought great numbers of students, especially at the larger universities. Under the influence of christianity, the growth of hospitals, which had survived the decay of the Dark Ages, became the most notable and effective department of medicine. Many orders of monks and knights devoted to the care of the sick, proved efficient agents in building hospitals, and at the same time in maintaining the close connection between Medicine and the Church.

It is interesting to consider the organization of some of the early universities. Some became largely ecclesiastical, as Paris, Oxford, Montpellier, and were governed by a corporation composed of students, and masters, under a chancellor, with the votes in the hands of the masters. Bologna,

Padua, Siena, were great law schools, the rector being elected by the students. Naples and Salamanca were State Universities, founded by a monarch, with papal recognition. The control of the universities was much more democratic than it is at the present time. Rigid standards of work were required of the students, and great formality surrounded the giving of degrees. In 1140 A. D. practitioners of medicine were required to secure a license from the university after examination. Erasmus was required to spend eighteen years at the University of Paris before he was allowed to preach a sermon. The influence of the old scholasticism was dominant and even intensified. The eyes of the State, the Church and the public were upon the activities of the universities, and the position of the scholar was rather enviable.

Yet, mediæval medicine had problems with which it was wholly incapable of dealing. Infectious diseases of all sorts ran unrestrained riot. Leprosy, tuberculosis and malignant syphilis were extremely common. Scurvy, rickets and ergotism were widely prevalent. Influenza, typhus, glanders and streptococcus infections maintained a continuously high incidence. In 1348 the Black Death, bubonic plague, swept over the entire western world, after devastating Asia, and caused the loss of about one-fourth of the entire population of Europe. Medicine survived these vast evidences of impotency, and it seems not impossible that thinking men began to realize that the old doctrines were unsound and inadequate, that scholasticism and philosophizing about disease must be replaced by more direct observation and study along entirely new lines. These significant changes actually occurred in the real revival of learning of the Renaissance.

The Renaissance, 1453-1600, was marked by the discovery of America, the circumnavigation of the globe, the new astronomy of Copernicus, the Reformation, and wide expansion of the field of learning with the foundation of many new universities. Not all of these events may be referred to the influence of the universities of the pre-

vious three centuries. There was a general rebellion against the dogmatism and scholasticism of the old schools. Most of the progress was made by the original thought of conspicuous individuals who came into violent conflict with established powers. In medicine there was an array of great names recalling the ancient Grecian period, Paracelsus (1493) reviled Galen and the medical gospels, and lectured from his own experience and experiments. Vesalius, 1514, despised Galen and established the modern conceptions of anatomy. Ambroise Paré, 1510, greatly advanced the theory and practice of surgery and obstetrics, and founded legal medicine. These men were far less polished scholars than their Greek prototypes, but they were nearer the practical truth and far more aggressive, risking their lives in attacks upon dogma and authority. Servetus was a modern Socrates, who was burned at the stake as a reward for his belief in the pulmonary circulation.

Improvements in medical teaching made slow progress. Medical practice certainly did not improve, but abounded in superstition and quackery. The plagues continued. Physicians were the butt of much ridicule. Throughout it all the medical universities showed little concern about their practical responsibilities. Most of the newly founded universities were devoted to other branches of learning. It would seem that during the Renaissance medicine lost something of its commanding position, for which its persistent worship of scholasticism must be blamed. It had little to offer in comparison with the great advances made in other fields.

The 17th century was again a period of individualism, resulting in many great discoveries, the circulation of the blood by Harvey, 1628; the microscope, used especially by Kircher in medical studies (1602); bacteria, by Leeuwenhoek, 1632; and the founding of histology, Malpighi, 1628. Sydenham stands out as a violent opponent of the new scholasticism and as a genius in refined clinical observation. He did more than any other physician of the century

to maintain the confidence of the public in the medical profession. Medical teaching became more concentrated in a few universities, and these fell into comparative disrepute for idle thinking and the pursuit of learning for its own sake. Many medical societies sprang up and took the lead in medical progress, as at Naples in 1560, and the Royal Society of London, 1660. The mortality from disease was as high or higher than in the Middle Ages. It was especially severe in child-birth and infancy. There was a sad discrepancy between the numbers of famous names and real discoveries in medicine and their practical application in the healing of the sick. For these conditions medicine was not entirely responsible. The main interest of the human race in these two centuries was not medicine, or science, but war, on an ever increasing scale, small and large. Human passion and greed vied with an evil nature in destroying human life, employing ferocious massacres, and continuous beheadings and burnings at the stake for trivial offences against established authority.

In the 18th century the picture changes for the better, owing to the influence of many notable scholars, the general advance in knowledge, and the improvement of public morals. Boerhaave at Leyden was a commanding figure in clinical medicine. Haller systematized physiology, Priestly discovered oxygen, the three Moores established the teaching of medicine at Edinburgh on an excellent plane, the Hunters advanced surgery at London, and Jenner introduced vaccination against smallpox. American medical teaching made its bow at Philadelphia in 1765. Yet, the average standard of medical practice was poor, and hospital conditions are said to have been the worst in history. Medical education was dominated by a few great personalities who were rather loosely connected with universities. In England many hospitals undertook to teach medicine as well as care for the sick, a policy which dominated British medicine for more than a century. It developed great clinical teachers, like Pott, Cullen, Monro, Hunter, but it was not well adapted to advance medical

science. With the current state of knowledge, it was probably the best line of progress, for medical science was marking time. It was certainly the most lucrative, for many of the practitioners of the day became wealthy and a few were philanthropic. As a phase of the prevailing caste system, the successful physician indulged in outlandish overdressing, cultivated a pompous manner and pursued social advancement. The social position of the doctor reached its highest point in history. A great army of quacks imitated the regular doctors and achieved almost equal or greater success. Here is the period where modern reformers may study the effect of material prosperity on the progress of medicine. Apparently it had no deleterious effect, and its vices were the result of the world wide adoption of the caste system. Probably the greatest scientific advance was made by Morgagni at Padua, who for the first time correlated clinical symptoms with pathological findings on a great scale, thus founding modern pathological anatomy. The great bulk of our present descriptive knowledge of clinical medicine was acquired in this period, legal medicine was founded in Germany, medical history was actively cultivated, many medical societies were founded, medical journals began to increase, and thus medical knowledge was widely extended and more influential. Yet university medical schools were not well organized, and theories of the nature of disease were fanciful. Even the use of Latin in medical teaching was not discarded until the middle of the century.

An interesting event in the history of medical education of this period was the reorganization of the Vienna school by Van Swieten. To the old group of quiescent scholars, dull Latin lecturers, in this faculty, this reform must have appeared as unwelcome. But Van Swieten was not a professional reformer, but an able teacher and investigator. He did not remove the whole Faculty by one stroke, but with the support of Maria Theresa he took several years to introduce new men and new methods, including clinical bedside teaching. It is particularly interesting to note

that the new men transplanted did not themselves become famous, but merely brought the school up to date. The real period of eminence of the Vienna school in pathological anatomy and clinical medicine did not come until seventy-five years later.

The period of Modern Medicine began toward the latter half of the 19th century, with the discovery of anæsthesia and antiseptic surgery, the establishment of Virchow's cellular pathology, and the beginning of the bacteriological era. Before these events there could be no sound conceptions of the nature of disease, curative medicine was under great handicaps, and preventive medicine worked in the dark. The cellular pathology was the natural fruit of the high development of pathological anatomy and histology to which many contributed. Bacteriology made rapid strides in the discovery of the bacterial causes of disease when the theories were established by Pasteur and the technical methods were devised by Koch. Chemistry, physics, and biology received great stimulus and sound direction from these great advances in medicine. Experimental methods were employed with new success in every branch of medical research. In a field thoroughly prepared by the elaborate descriptive clinical studies of the previous century, medical problems began to fall with amazing rapidity.

The ease with which the new methods revealed important new facts caused an enormous expansion in the scope of medical research. The completeness of the solution of many century old medical problems stirred the imagination of scientists in every direction, and led to rapid advances in all departments of science and to broad generalizations. It was an intoxicating period in the progress of knowledge. It may be presumed that these things occurred as they did because many lines of endeavor coincided, and the times were ripe. Yet, it is highly probable that a prime and essential factor was the improvement in the organization of universities which began early in the

previous century and made rapid progress as the political conditions of Europe improved.

The idea of coöperative intelligence in related branches of knowledge as represented in a great university was best conceived in Germany. The German universities grew steadily in size, quality of personnel, ideals, and material resources. They became the pride of the nation and especially of the cities, large or small, in which they were located. They also became fully recognized as the main bulwark of industry, art, and commercial advancement. The organizations were based upon a broad and sound philosophy. It is impossible to escape the conclusion that the progress of German science, especially of German medicine, was based mainly upon her great universities. The same movement in the organization of universities extended to other European countries, to France and England with somewhat greater individualism, and later to America and Japan. Today the University stands at the peak of its power in the favor of governments, and the estimation of the public, as the main source of human progress. The record of progress in medicine of the past century, which has been chiefly the product of the medical faculties of universities, is probably the chief reason why the university occupies its present fortunate position.

The foregoing review is not an attempt to sketch the history of medicine. It merely presents a few outstanding events of that long record to show the vicissitudes of the university idea in history; its first appearance in ancient Greece; its transfer to the Roman empire, to Egypt and Arabia; its disappearance from Europe in the Dark Ages; its survival in Arabia and Egypt; its sudden rebirth, almost like a biological mutation, in Salerno; its part in causing the revival of learning and the general Renaissance; its decline in the 16th and 17th centuries, and its second rebirth in the 19th century, leading to the amazingly rapid development of modern medicine. Rather than review further its most recent contributions with which you are all familiar, it is proposed to inquire more

carefully what is a University, and what is the university idea.

II

The University Idea.

The university idea involves the coöperative intellectual and moral effort to collect, disseminate and apply knowledge for man's needs.

Coöperation between the various branches of knowledge is perhaps the first essential of a university and becomes more necessary as the complexity of problems increases. Most of the great advances in medicine have resulted from the reflection of new knowledge in one science upon the problems of another. In order to have coöperation, the men in a university must have the social instinct and understand the significance of the social relation. Here, at the outset, is a very difficult and complex problem, how to secure voluntary united effort among scholars, without interfering with individual effort and ambition. It cannot be secured by mandate, but it may be conserved by deliberate efforts of university organizers. It must be based on mutual respect, character, and community interest. Experience shows that institutional pride, a sense of ownership in one's own products and partnership in the achievements of one's colleagues, all directed toward common ends, have been the most efficient factors in securing coöperation. A sense of loyalty and intellectual honesty belongs to coöperative scholarship. There are many instances where the influence of a commanding personality in a university, an intellectual or official leader, himself exemplifying the desired qualities, has secured the highest type of loyalty and efficiency. It has been said that every great institution is but the shadow of some man. It is the belief of many that in the choice of a university faculty, one will go further by choosing men rather than experts.

Thus, the very first problem of the university encounters that most fundamental question of morals. One must

therefore stress the moral aspect of university organization to the fullest limit. In the advance of knowledge, the end must not justify the means, for if there are not moral standards in a university where are we to find them? The Church preaches them, the Law attempts to compel them, business often flouts them, but the public conscience expects the exhibition of them by men associated in a university. The moral law applies to the officers of a university quite as much as to the active workers. I doubt if any university can go far under the leadership of a man who has only a loose sense of right and wrong. One must practice the cardinal virtues before attempting to cultivate genius.

In order to preserve loyalty and morals in a university, the organization must be designed wisely for that purpose. The earliest schools solved the difficulty by having very little organization and that in the hands of students and teachers. It was an ideal method, and worked well, but is too cumbersome for modern conditions. Other schools were supported and directed partly by the state and some were chiefly products of the Church. History shows rather clearly that the church has never been very successful in conducting universities, especially medical schools. One may well wonder why the medicine of the monks was not more productive, since they should have been well provided with leisure, loyalty, and morals, but we have modern instances of failure by the church in the same field. In modern times the State has appeared at its best in university affairs, especially in Germany and France, by providing funds, and creating a group of experts in university organization, who generally wisely kept their hands off the internal workings of the university.

For many centuries and after many digressions, the opinion has strengthened that the essential policies of a university should be determined by the scholars themselves, or through their agents, while non-professional officers should deal only with finances. It is a question of deciding complex and technical matters by men who have first-

hand knowledge. The best results have followed this policy as with the great German universities of the last century.

When scholars have been chosen for personal and moral qualifications, it cannot fail to work well. If they are not so chosen, the whole structure must be faulty and no scheme of organization will correct the fault.

Combined direction by a body composed of laymen and scholars has long been active in the University of London, with excellent results, but the questions submitted to this body are of a general nature. This body actually inspects the workings of various medical schools under the University of London, and adjusts grants to the schools according to its best judgment, but for the past forty years it has taken no part in the choice of the faculty. There have been no conflicts in the working of this organization, and it is needless to say that the men composing the body possess high moral and personal qualities, and understand the university idea.

In America there is a notable lack of uniformity in the executive management of university medical schools and frequently a failure to recognize the best university standards. Experience shows that most of the minor and some major troubles arise just at this point, where in the interests of executive efficiency valuable traditions are neglected and an important source of loyalty is sacrificed. Owing to the executive indisposition of scholars, the president and his appointee, the dean, have sometimes been led to exercise plenary powers and even to assume professional and spiritual leadership. Under some conditions such expedients may have been necessary, yet an energetic president and an aggressive dean subordinating the faculty, are better suited to a business organization than to a university. The deanship implies maturity and the qualities of leadership and these are best judged by scholars in whose hands the nomination of dean should rest. A president possessing broad vision and a tactful dean

cordially coöperating with the faculty furnish ideal conditions, and unless these are fully met many believe that the office of the dean should be abolished and his executive function filled by a lay officer. The university idea is comparatively new to most American medical schools, while practical problems have been very numerous, and to these facts we may attribute our failure to reach a real university standard in organization.

Universities have traditions to which they cling tenaciously and which are often very valuable possessions, but may become serious handicaps. These traditions are the result of long experience and careful thought by leaders, past and present, and they generally dominate the organization and activities of the schools. They make character and quality in an institution. They enable the school to weather storms of criticism, and the assaults of reformers. They conserve the self-confidence and loyalty of the scholars and students, and they offer a splendid example of mental and moral equilibrium to other governmental and social institutions. They tell the iconoclast that there are immutable standards of right and wrong, that past progress is substantial and the future full of promise. Traditions are strongly entrenched in Germany, France and England, where they are hedged about by complex barriers, and it is so difficult to change them that few attempts are made to do so. Rigid adherence to theory and prominence of clinical study are characteristic of French schools, thoroughness and originality of the Germans, and solidity and critical ability of the English. The subtle influence of tradition is best seen at Oxford and Cambridge, where the English youth acquires a stability and refinement of character hardly equalled elsewhere. Most observers find the source in the constant contact of young men with ancient halls, sensible of the influence, still potent, of past masters and disciplined in the old well tried methods of thought, study, and conduct. Yet, the efficiency expert would tear down the old mouldy crumbling halls, erect modern hygienic buildings, throw out the useless readers,

abolish the ancient and superfluous Regius Professorship in medicine, reorganize the cumbersome government, abolish old ceremonies to save time, and generally ruin the whole splendid structure. American universities also are old enough to have traditions and American scholars cling to them firmly, but we are not so sure of their value. We permit changes and experiments, small and great, on slight provocation, and rejoice to see the survival of the good after periods of chaos. The great danger of traditions is scholasticism, but history shows that the taint of scholasticism survives reform and can only be reached by intelligent appeal to the morality of scholars.

Among the time honored traditions of universities are nomination of appointees by one's peers, and life tenure of office for established scholarship. The actual power of appointment may well rest in other hands. Here lies the mainspring of loyalty and morality. These standards assure that appointments will be made on merit, as judged by personality and a record of achievement. Without them advancement may be sought by salesmanship, and political and social influence, and made in accordance with the swings of fashion by anyone who happens to be in authority. In France, England and Germany the available candidates have passed through a long series of qualifications by which they advance step by step to the higher positions, a method which encourages consistent work, and eliminates the adventurer. In England where the method is followed rigidly, some men may be advanced on length of service without corresponding ability, but prominent British educators assert that the advantages even of this system far outweigh its faults. The demotion of a professor in Germany would be regarded as a calamity subject to searching investigation, and such an event has virtually been unknown. While age is an uncertain standard, retirement at sixty-five or seventy years is generally a wise provision.

While American universities generally aim at the highest standards there is a lack of the rigid barriers and traditional safeguards maintained in the older European

universities. It is not surprising therefore that there have been occasional violations of established precedent, which it is best to regard as incidental to our unsettled conditions, to the rapid growth of university faculties, and to the necessity of frequent changes. It is not wise to minimize their importance, because they lessen the loyalty and morality of scholars, and they tend to sharpen the political sense of young doctors who are entering a university career. Human nature may not change much, but conditions do. Forty years ago I never knew of any laboratory worker whose work was definitely influenced by political considerations, but today the younger men discuss with the utmost frankness the political significance of their researches, utterances and contacts. The responsibility for these changes is very great and unless they are checked American medical scholarship will suffer lasting harm. It is not difficult to trace these changes to unfortunate practices which have survived recent reforms or have even resulted from them.

If contracts made by one administration are overlooked by a succeeding administration, one must infer that precedent is not well established in that school.

If the leading members of a faculty are forced out for the benefit of the favorite healer of a high political official, one must conclude that the basis of such a university is very unstable.

If all the higher positions in a faculty are declared vacant in order to make way for a cherished reform, one must ask whether the end justifies the means. The violent dislocation of established teaching staffs is an exceedingly drastic measure which many a man with fine sensibilities would hesitate to advise or undertake. Even Maria Theresa hesitated at such a step.

If authority is given to one man to choose an entire new faculty on his own knowledge, aided by those whom he chooses informally to consult, the question immediately arises—Why depart so widely from safe precedent, and

why not divide the authority among those who must later accept official responsibility?

If the policies of university medical schools are wisely based on traditions and are safely determined only by responsible experts with long experience, is it not clear that interested laymen run great risk of doing harm when they undertake to direct or control these policies?

To our European colleagues these violations of university methods in America appear to be inexplicable. Many have assured me that they cannot exist in Germany, France or England, and they regard them as a grave danger to university prestige in America. Thus, if established principles are neglected, even in good hands, and in spite of good intentions, expediency beclouds judgment, opportunity outrides tradition, and ambitions replace ideals.

III

The foregoing incidents lead directly to another paramount factor in American medical education, the influence of organized philanthropy.

Everyone recognizes that the great foundations have been directed with wisdom, mainly by scholars of high repute, and that their policies have been based on the investigations and opinions of experts in many fields. Probably no new American activity has received more thorough scrutiny and deliberation. The British Commission on Education has for centuries conducted studies on educational problems, but in America there was no such group of experts on whom to rely in the solution of new problems. In creating such a group the foundations have done not the least of their services. It is not surprising that the Foundations have been accessible to innovations, earnestly pressed by their proponents, but not fully understood or approved by the great body of scholars. The project of full-time clinical service is one of these innovations.

University men can offer no objection to the trial of this experiment, but they have regretted some of the conditions

under which the experiments have been conducted. We trust that the results of the trial will be viewed with scientific courage.

The central idea of providing young men with opportunities for medical study free from financial worry was excellent and was wisely met by offering substantial salaries for this purpose. It was an entirely different matter to prevent university professors from overcharging their patients and neglecting their duties, for which the proper remedy was dismissal or moral suasion. The error was made of attempting to accomplish both these worthy objects by the same remedy and it has led to serious changes in the whole organization of medical teaching, some of which are not working well.

The first major consequence was the super-clinic with its enormous budget, calling for large sums of money which many think could be used better in safer projects. The most urgent need of medical education was larger support for the medical sciences, to enable professors and their mature assistants to live properly on their salaries. It was soon found that one had to pay the market price for snitable heads of the clinical departments, and when salaries comparable to those of bank presidents were added to the lure of scientific opportunities, the scheme lost much of its idealistic color. The old fashioned laboratory man, never having sat at the seat of custom, did not begrudge the liberal pay of his more fortunate colleagues but he was startled by the assumption that competent chemists, bacteriologists and pathologists could be found to work under the clinical leader, and he became alarmed to find his own traditional field of work dwarfed by his expansive neighbor. Thus far the only feature of the super-clinic which has fully materialized is the budget.

The full-time system has placed a premium on research and a discount on clinical efficiency. The responsible heads of clinical departments should be masters of their snbjects, but when young men who have merely performed

a creditable piece of research are given large clinical responsibilities they are compelled to learn their business at the expense of their patients. But clinical medicine can only be mastered by long years of hard experience. Thus one of the worst faults of the old proprietary school system was unconsciously reenacted. Recently more mature men have been chosen to head the clinical departments, but the choice has been determined mainly on achievements in research, and not on ability to deliver service of the highest type.

Hard times are now about to add their salutary complications and the immediate future of full time clinical service faces new trials. It is to be hoped that the effort to float the scheme in times of stress does not lead to further dwarfing of other activities. Certainly the plan should not be forced upon institutions, and the proponents would do well to confine the experiments to resources under their immediate control. Since the activities of the Foundations exert a profound effect upon medical education, university men look to them for the finest appreciation of the university spirit.

IV

The university is a place for the collection of knowledge and it is an ancient tradition that for this purpose a great library is essential.

In the Dark Ages medicine was mainly concerned with disputes over ancient and recent texts. The art of printing let loose a flood of revisions, writings and debates, which reveal an outstanding characteristic of the medical mind. Today an enormous volume of literature of every description from a multitude of sources crowds the ancient manuscripts into secure vaults, and submerges the real progress of science. Surely a consuming fervor of debate animates the medical profession, perhaps above all others. Yet, there is a fascination about the world of letters, unrestrained by harsh facts, which appeals to everyone, and inclines one to excuse the Dark Ages for their scholasticism, and the modern age for its colossal libraries.

America has always indulged a feverish passion for collecting books, and we have emptied many a foreign stack and cellar to fill our shelves. The outstanding features of medical literature today are volume, diversity, repetition, classification, practicality, accessibility, efficiency, not unmixed with fine literary effort and finish, but brevity and directness are lost arts. Americans are the most voluminous readers and publishers in the world. The library of the New York Academy of Medicine receives annually 1965 journals of which 679 are American, representing all branches of medicine and its collateral sciences. We have many great medical libraries, none exceeding in scope, usefulness and value the splendid collection of this Academy.

Yet, the art of printing was not an unmixed blessing. In many fields it has become almost as difficult to get the truth from books as to go out and discover it anew from Nature. Tons of printed pages come like an ocean fog from innumerable society transactions, great numbers of papers compiled for trivial occasions, extemporaneous remarks from all classes of speakers, hastily prepared orations, interminable case reports, undigested note books, etc., none of which are allowed to die owing to the ever present stenographer, stentype and pestiferous dictograph. The worst offender is the record breaking investigator in the medical sciences, who serves up an endless supply of scientific tidbits. There is a well known racial tendency to leave nothing unsaid, and an equally well known national habit of encyclopedic display of knowledge without thought, both of which crush the honest reader. The Swiss physiologist of the 18th century, von Haller, was an infant prodigy, who produced 13,000 scientific papers and gave our most esteemed branch of medical science an impulse from which it is still vibrating. This is a record, and our modern contenders must not attempt to break the record. On the contrary the physician should feel a sense of responsibility every time he takes up the pen, realizing that he is about to add permanently to the mass of literature. It is now generally appreciated that the

number of papers produced by an author is usually in inverse ratio to their value.

Yet, there are many gold nuggets in the sands. Scholarly text books, authoritative systems, erudite texts, and crisp announcements were never so numerous. World literature was never so easily accessible or so eagerly sought and the written word was never a greater power in the progress and continuity of medicine.

On another side, I would enter a plea for greater appreciation and use of the scholar with broad experience and wide erudition as an efficient source of knowledge. There is a subtle power in the spoken word always missing in print. If it were not so we should abandon teachers and use only books. A half hour with Sir Wm. Osler was worth a month in the Bodleian library. As a matter of fact the great bulk of effective knowledge in the world comes from conversation and deliberation with those who know. The value of such men in a university should be more formally recognized.

Research now occupies the centre of the stage in the program of most university medical schools. Human ingenuity has been strained and material resources taxed to elicit new facts about disease. The results are most impressive and in no other age has there been such a volume of new information about all phases of medical problems. One may perhaps also say that in no other period has available knowledge been so usefully applied, for much able effort has been directed to the dissemination of knowledge and its application at the bedside. A fine spirit of inquiry and investigation pervades the medical schools, hospitals, and societies, elevates the standards of practice and curbs destructive criticism.

It is necessary to distinguish between mere observation and research, and by so doing we at once exclude the great bulk of so-called original investigation. Interesting isolated case reports, peculiar variations in anatomical findings, improvements in chemical technics, isolated findings

of new chemical and physical variations in pathological processes, uninterpreted results of experiments, may educate the writer, but do not constitute investigation. True research involves the attack upon a definite problem, the setting up of an hypothesis, and the demonstration of the truth of the hypothesis by adequate methods, and with convincing evidence. The discovery of insulin is an example of real research and original investigation. One hastens to add that observation is the main means of discovery of medical problems and consecutive observation has in the past furnished the solution of many. It was almost the sole weapon of the old clinicians. Research in the literature was the main occupation of mediæval physicians who thumbed the medical canons for centuries without results, and it still remains a favorite pastime. The modern scholastic loves to rediscover old facts by new methods and claims that we are now engaged in quantitative estimations of the phenomena of disease. This dictum assumes that the facts are already known. There is a point in the course of most investigations where the aid of experiment is necessary, but pure experimental research on manmade problems is overdone and its results, unless closely controlled and applied, have been disappointing. This is the antithesis of the old scholasticism and shares its faults.

In recent decades the universities have lost some of their dominance in research, owing to the increasing complexity of problems and the necessity of providing men and materials on a large scale. Throughout the world there are many research institutions, private and governmental, which are contributing a very large share of medical progress and the conditions in many of them are rather more fortunate than in most universities. Some very important medical problems are now largely in the hands of industrial concerns which handle them with fine recognition of the university spirit. Yet, pure research tends to scholasticism, and industrial research has relations with commercialism, so that both these movements are regarded

with anxiety by most university men, who would prefer to see the universities retain a dominant position in medical research.

These few phases are mentioned in order to point out that knowledge makes progress in exceedingly varied and devions ways. The flower of research will not flourish in the highways and byways. Therefore any attempt to direct or coerce research according to the ideas of commissions and organizations is probably unsound. Complete freedom of thought and action are essential conditions, for it is generally the non-conformist who makes progress.

V

The University is a place for the dissemination of knowledge, which is equally important with its collection. Teaching in all its phases is probably the most constructive of human activities, the most effective factor in binding individuals in the social state, and the chief agent in maintaining the continuity of knowledge from age to age. The facilities for medical teaching have had revolutionary advances in the last half century, and the results are excellent. Yet, the art of teaching remains the same as ever. Its essence consists in personal contact, the spoken word, a fitting personality, and the instinct of the helping hand. Here the university spirit finds some of its best expression. To cultivate the faculties of the immature mind, to give opportunity under direction and to see results, is to add something to the world which would not otherwise exist, and is the chief reward of the teacher. Medical history abounds in examples of the influence of the great teacher, extending often over several generations. Such men have been loyal friends of their pupils, and have never ceased to exert their influence to advance their associates in every proper way. They have had the ambition to produce men superior to themselves. Over against the helping hand is the idea of the big brother. Some teachers assert that they address themselves only to the best men in the class and neglect the others. Conscious of superiority, they clamp

down their own ideas and methods on the brilliant student, they see their own reflection in his success, which they are very apt to appropriate, they love the ease of working with capable minds, but they contribute little that would not otherwise exist. The big brother impulse has many ramifications in and out of university life, but it is contrary to the university spirit. It is a fortunate school that numbers in its staff many self-effacing, hard working, earnest men who take pride and pleasure in seeing creative work throughout the ranks of their students and whose departments are free from dogmatism, egotism, and self-assertion. Yet, one almost never sees a department head deliberately chosen for these rare qualities. The premium on brilliancy and so-called productivity generally singles out men of quite a different type.

The study of medicine has a very high cultural value, probably exceeding that of any other department of learning. The intrinsic value of a knowledge of medical science and clinical medicine is very great, and this is the reason why it is sought by thousands of young men and women quite apart from the earning capacity and privileges which the doctorate in medicine confers. Acquaintance with the structure and functions of the human body, of the causes, mode of origin, course and control of disease, discipline in scientific modes of thought, respect for authority, consciousness of one's own limitations, are some of the qualities which generally make a knowledge of medicine conspicuous in its possessor. Physicians, who do not practice medicine, have often exerted a powerful influence for good in public affairs, especially in Germany, and that influence is greatly needed with the growing complexity of the problems of modern life. Yet, modern university medical schools deny this knowledge to hundreds of applicants and thereby lose a vast opportunity to advance the standard of general intelligence and extend the influence of the university ideal. Compelling excuses are believed to exist in the difficulty of supplying adequate facilities of the best

type, but the responsibility can hardly be dismissed in this manner.

There are today 13,000 fully qualified applicants for medical instruction in this country, but only 7,000 places available. Thus, the institution designed to supply a need becomes the chief obstacle in the way of the satisfaction of that need. Descartes has said: "If there is any possible means of increasing the wisdom and ability of mankind, it must be sought in medicine."

Fortunately, the dissemination of medical knowledge does not end with the university, which rather naively admits that it only lays a foundation. Some medical educators aim to teach as little of practical nature as possible, in which ambition they are often remarkably successful. Postgraduate education looms too large for the present day university program, but the task is taken up by innumerable other agencies. Local, social and scientific, urban, interurban, county, state, national and international societies, journals and conferences form a vast and effective scheme for the interchange, dissemination, advancement and employment of medical knowledge. We may at least claim that in the workings of this scheme the influence of university men predominates.

VI

Finally, we come to that fundamental question, the place of utility in the conception of the university. I have ventured to emphasize, perhaps, overemphasize, the idea of utility for man's needs as a guiding principle in the university program. This proposition may appear self-evident to many, but the history of medicine shows that it has been contested, and often overridden at many periods, and it lacks general acceptance at the present day. During the decay of medicine and the reign of the medical gospels in the Dark Ages, it was wholly discarded and medical knowledge was sought in parchments and for its own sake. At this very time the influence which kept med-

icine alive was the enormous and everpresent task of caring for the sick. The growth and achievements of many knightly orders consecrated to the relief of the sick throw a splendid light over those melancholy centuries. For a very long period hospital construction, nursing, and hygiene made remarkable progress, while medical science stood still. For a longer period the methods of teaching medicine were inherited ends in themselves, so cumbersome in the exclusive use of Latin, as to thwart the object that should have been in view. In the Renaissance it must be suspected that the rivalry between competing universities, some of which drew great numbers of paying students, perpetuated dogma, artificiality and institutional reputations, over utility and progress. In the seventeenth century the large rewards obtained by many successful practitioners made dress, manner and reputation the chief ends of the medical man.

We may amuse ourselves reflecting over the woeful deficiencies of former generations, but it is not difficult to detect traces of these same faults in present day institutions, and the fact that they are mostly due to neglect of a sound principle of utility. It is a widespread doctrine that science in a medical school should be pursued for science's sake, and hence we see the fundamental sciences taught mostly by men without medical training or interests, who often deliberately neglect the medical aspects of their subject. Most of these men realize that they would be better and happier in their work if they had had a medical education. Who can understand the liver if he has not seen it in acute yellow atrophy? Who can know the cell if he has not followed its cancerous riot? There was a time when it was difficult to secure physicians competent to teach the preclinical medical sciences, but that time should have passed.

The great expansion of experimental medicine often leading to the pursuit of random topics and questions distantly related to medicine, may be a necessary phase of the growth of the scientific spirit, but it distracts atten-

tion and resources from the real, urgent, and often solvable problems of medicine.

The close affiliation or union of general and special hospitals with university medical schools and the introduction of the university spirit into the life of hospitals is the most significant advance made in medical organization in this century. It mitigates the rigid scientific spirit, directs it to the practical problems presented by sick patients, and encourages the study of these problems under the best conditions. There is good reason to believe that the progress of clinical medicine in the immediate future will depend largely on the more intelligent interpretation and use of data secured in the laboratory. The laboratory trained clinician has many advantages, but it is difficult to shine both at the bedside and in the laboratory and many fear that pure clinical research and the art of medicine are unwisely neglected by the praiseworthy attempt to cover both fields. Unless a safe principle of utility is adopted, the laboratory clinician may become absorbed in the rediscovery of old facts by new methods, and the easy pursuit of interesting but secondary phenomena of disease.

The universe is full of interesting facts, as numerous as sand grains on the ocean beach, but not all are important, and the wise investigator and physician imbued with a sound university spirit, will choose carefully and avoid being lost in the sea of knowledge. All these tendencies and many others form the modern scholasticism. We have seen its deadening effect on the medicine of the past, and we should defend against it by intelligent adherence to the principle of utility. "All knowledge attains its ethical value and its human significance only by the human sense with which it is employed" (Nothnagel).

Modern university medical schools, especially the American, are singularly slow to realize the enormous growth of many medical specialties, the opportunities for service, the dependence of progress on experience, and the necessity of providing adequate facilities for such normal and

inevitable growth. The institute idea seems to be new to many who find themselves directing university development. Yet, institutes of pharmacology began to appear in the 17th Century, and institutes have figured prominently in the growth of many branches of medicine ever since. They are particularly necessary at the present stage of medical progress, especially as viewed from the utilitarian standard.

Yet two New York Schools have recently absorbed famous institutes of obstetrics, founded by men of vision, with long and excellent records in education and service. They are now merged with gynecology, in accordance with a policy recently adopted by many schools. Only experience can determine whether obstetrics will profit by these changes and whether these institutions will thereby be able to improve on their past records. In the meantime many regret the passing of these old-time ornaments of New York medicine, and they hope that New York has not lost the opportunity of duplicating some of the famous maternity hospitals of the world.

Not one of the great university medical schools has taken a vigorous initiative in the modern movement for the control of tuberculosis, or cancer, by the creation of institutes for service and research in these paramount interests of humanity. All the medical schools do a little orthopedic surgery, but the progress of orthopedics was long since consigned to special hospitals and institutes devoted exclusively to this field. The same situation holds in pediatrics and contagious diseases.

Dental institutes are making progress slowly but surely, but legal medicine knocks in vain at the university back door. On the other hand, the McCormick Institute for Infectious Diseases at Chicago, the School of Hygiene at Hopkins, the Institute of Human Relations at Yale, and the department of psychiatry of the New York Hospital-Cornell Association, are fine expressions of the institute idea, and ominous signs of the size to which the arms of

university medicine must grow if it is to keep pace with progress. Yet, in general, it must be admitted that the growth of modern medicine in recognition of the principle of utility, the demand for service and the dependence of progress on service, have outstripped the vision of the organizers of university medical schools. Unless these demands are met, the real progress of medicine will pass out of the hands of the universities, as it has already partly done in some fields. These schools will then be free to devote their vast resources to the pursuit of medical science as a branch of biology and to experiments in medical education. This is the essence of scholasticism.

The University medical school has never known quite how to handle the question of the extramural activities of its scholars. In general it discountenances such activities without much concern about their great educational value. It leaves the busy world to take care of itself. It feels little responsibility for the way medicine is practiced.

Into this breach medical men with the university spirit have thrown themselves with energy and intelligence. The results have been excellent because they adopted the principle of utility. Organizations have been formed devoted to the advance and dissemination of the higher branches of medical knowledge, to postgraduate instruction, to the collection of great libraries, to the organization and elevation of hospitals, to the interests of the nursing profession, to problems of public hygiene, to the policies of governments in medical affairs, and in fact to all the practical relations of medicine in social life. These bodies have long been a powerful influence for good in their communities, and they have generally been animated by a fine conception of the university spirit. Such a body is the Royal College of Physicians of England, originated in 1518 and gradually reaching its present form and influence after centuries of service in the field of organized Medicine. The Royal Society of London was founded in 1660. Similar societies followed in Naples, Dublin, Berlin and Paris, all devoted to the advancement of science and its practical applica-

tions. Today every great city supports one or more societies engaged in the extension of university medicine in its community.

There was thus ancient precedent for the formation of the New York Academy of Medicine in 1847, but there are few if any examples of the remarkable growth of its activities and of the influence it exerts in its community. Its great library elevates the standard of medical knowledge in this and other neighboring cities. A long list of affiliated societies prosper under its patronage. With rare vision, it has discerned and embraced many opportunities to advance and extend the application of medical knowledge. It is concerned with the standards of medical practice and morals, censors medical news, protects the public against errors and abuses, coöperates with medical schools, influences legislation, and adopting the principle of utility, interests itself in all that interests medicine and the public. It is one of the most efficient of all agencies in extending the influence of medicine into a broad and extremely practical field.

And now, what does this review of the history and present position of the university reveal? Does it not show that the university has been at nearly all times the main-spring of intellectual and scientific progress? It may have declined with the decay of nations but it has always taken the first step toward the revival of learning and the advance of knowledge. Hence it has survived religions, is more powerful than government, and has a better record than the Church. In the university medicine has always occupied a commanding position because it deals with a primal necessity, self-preservation. At times medicine has been almost the sole source of inspiration toward learning and intellectual effort. Medicine directed by the university idea has accomplished great things in the control of disease and the revelation of man's physical nature, but its main task still lies before it. We may not wisely conceive of a world without physical evil. It would hardly be human. There is no such danger. Yet there are voices ac-

claiming the arrival of the day when medicine, having virtually conquered the old diseases, may now pass on to birth control, eugenics, and the superman—dreams, possible to him who ignores the stern realities of the sick room and the dead house. Preventive medicine has done much, but the era of clinical efficiency in curative medicine is still to dawn.

The world looks hopefully to the university and its medical school and to educated physicians to go forward with the task of controlling disease and carry it as far as may be. We shall therefore jealously guard the best traditions of the university ideal. We shall see to it that attested medical knowledge is carried into every human activity and relation where it may be of service in the control of disease and the elevation of the standard of intelligence, and by coöperative intellectual and moral endeavor, we hope to justify mankind's great adventure in altruistic effort, the university.

PURE AIR AND CLEAN STREETS EXHIBIT

Lack of proper methods of street cleansing and of the removal of waste detracts from the appearance of the city and invites negligence on the part of the public. It carries in its trend more important consequences than unsightliness and the pollution of our bay waters. The open garbage can is a feeding place for insects and rodents, and thereby contributes indirectly to the transmission of many diseases, of which flies, vermin and rats are carriers. Improper sweeping results in filling the air with dust, as does the practice of dumping ash cans into open carts. Other deleterious elements in the air we breathe in the city are: the carbon monoxide from the exhaust of automobiles and the smoke and soot which come from the chimneys of buildings and from stacks of boats plying in the city waters, as well as the mineral dust that comes from building operations, the tearing up of streets, the cleaning of buildings by sand blasting, and other similar sources.

The New York Meteorological Bureau in New York City measures daily the amount of dust suspended in the air, and it was found that over the Central Park Area, which is probably one of the most favored areas in the city, the amount of dust and soot suspended averaged 3.97 tons per cubic mile of air, during 1930. On moist days this suspension creates a pall which deprives the city of much sunlight and, particularly, of ultra-violet rays. Aside from the injury to our eyes and to air passages which the impurities of the air create, the amount of economic loss caused, directly or indirectly, is considerable. A great deal of coal and oil is being wasted by improper combustion, and the destruction of fabrics and household effects runs into hundreds of millions annually, according to the estimates made. As has been well said, excessive smoke is not a necessity but a luxury of laziness and indifference.

It is not only for the purpose of impressing on the public mind the menace to health of impure air and dirty streets that an exhibit will be held at the New York Academy of Medicine, under the joint auspices of the Academy Committee on Public Health Relations and the Committee of Twenty on Outdoor Cleanliness. It is being arranged primarily as an educational measure to stress the possibility of preventing this nuisance as well as health hazard. The exhibit, which will be open to the public, will begin January 12th, 1932, and continue for eight days. It will consist not only of graphs, charts, photographs, as well as various scientific instruments of precision used in measuring contamination, but principally of models of modern street cleaning apparatus, stoking devices, ventilating machines, and moving pictures depicting modern methods. In this endeavor the coöperation of the city, state and federal authorities is being enlisted, as well as that of scientific organizations and of the manufacturers of proper equipment.

RECENT ACCESSIONS TO THE LIBRARY

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PROCEEDINGS OF ACADEMY MEETINGS

DECEMBER

STATED MEETINGS

Thursday Evening, December 3, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers

Election of Fellows

II. PAPERS OF THE EVENING

Cutaneous manifestations of systemic disease, Udo J. Wile, Professor of Dermatology and Syphilology, University of Michigan

Discussion, Medical aspects, William R. Williams; Dermatological aspects, Howard Fox; Scrological aspects, Arthur F. Coca

THE HARVEY SOCIETY

In Affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, December 17, at 8:30 o'clock

THE THIRD HARVEY LECTURE

"INFECTION AND RESISTANCE TO THE BLOOD INHABITING PROTOZOA"

W. H. TALIAFERRO

Chicago

This lecture takes the place of the second Stated Meeting of the Academy for December.

JAMES W. JOBLING, President, Harvey Society

DAYTON J. EDWARDS, Secretary, Harvey Society

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILIOLOGY
 Tuesday Evening, December 1, at 8:30 o'clock
 ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Cases from the New York University and Bellevue Clinic
 - b. Miscellaneous cases
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF SURGERY

Friday Evening, December 4, at 8:30 o'clock
 ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. 1. A case of duodenal ulcer penetrating pancreas and liver; operation, duodenal fistula, and cure
 2. A case of duodenal ulcer penetrating three times
Lester Breidenbach
 - b. 1. A case of traumatic rupture of the common bile-duct
 2. A case of compound depressed fracture of the skull
Kenneth M. Lewis
 - c. Cases of postoperative ileus treated by enterostomy, Frank J. McGowan, Jr.
- III. PAPER OF THE EVENING
 The treatment of ileus as indicated by clinical experience and experimental studies, John J. Morton, Professor of Surgery, University of Rochester (by invitation)
- IV. DISCUSSION
 John A. Hartwell, Joshua E. Sweet, Frederick T. van Beuren, Seward Erdman
- V. EXECUTIVE SESSION

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, December 8, at 8:30 o'clock
 ORDER

- I. READING OF THE MINUTES
- II. CASE PRESENTATION
 Chronic hypertrophic interstitial neuritis (Dejerine-Sottas). From the Neurological Institute, Henry Alsop Riley
- III. PAPER OF THE EVENING
 The autonomic nervous system and its chemical mediators, Walter B. Cannon, Harvard Medical School (by invitation)
- IV. DISCUSSION
 Horatio B. Williams, Professor of Physiology, Columbia University, Smith Ely Jelliffe
- V. EXECUTIVE SESSION

Second report of Advisory Committee on requirements for Fellowship
(A full discussion of this important report is desired)

SECTION OF PEDIATRICS

Thursday Evening, December 10, at 8:30 o'clock

ORDER

PAPERS OF THE EVENING

- a. Special pediatric bearings of encephalography, Bronson Crothers (by invitation)
 - b. New trends in encephalography, Leo M. Davidoff (by invitation), Cornelius G. Dyke (by invitation)
- Discussion, Benjamin Kramer

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, December 16, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
The value of intravenous pyelography in the management of ureteral calculi; based on a study of 45 cases (lantern slides), Ralph L. Dourmashkin
- III. PAPER OF THE EVENING
Neurosurgery in the treatment of diseases of the urinary bladder, James R. Learmonth, Mayo Clinic (by invitation)
Discussion opened by Byron Stookey, Nathaniel P. Rathbun
- IV. GENERAL DISCUSSION

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, December 18, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
Maggots and their use in the treatment of chronic osteomyelitis, Joseph Buchman (by invitation), John E. Blair, Ph.D. (by invitation)
- III. DISCUSSION OPENED BY George E. Bennett, Baltimore (by invitation), A. M. Rechtman, Philadelphia (by invitation), M. M. Pomeranz
- IV. EXECUTIVE SESSION

SECTION OF MEDICINE

Friday Evening, December 18, at 8:30 o'clock

(Please note change of date)

ORDER

PAPERS OF THE EVENING

Neoplasms of the lungs and bronchi

- a. Bronchoscopic features, Chevalier Jackson, Philadelphia
- b. Clinical features, Harry Wessler
- c. Pathologic basis of symptomatology as shown by roentgenograms and specimens, Coleman B. Rabin (by invitation)

Discussion, J. Burns Amberson, Jr., Adrian V. S. Lambert, Lloyd F. Craver

SECTION OF OPHTHALMOLOGY

Monday Evening, December 21, at 8:00 o'clock

(Please note change of hour)

ORDER

- I. READING OF THE MINUTES
- II. A case of abscess of cornea following cataract extraction, Clyde E. McDannald
- III. Two cases of exophthalmos as an early manifestation of leukaemia, Algernon B. Reese
Discussion, Loren Guy (by invitation)
- IV. Large implantation cyst of the iris treated by aspiration and injection of iodine, Ellice M. Alger
- V. Presentation of a case with von Recklinghausen disease (with microscopic slides), Arthur Knapp (by invitation)
- VI. The ophthalmologist and the lighting problems of his patients, Walter B. Lancaster, Boston (by invitation)
- VII. The ophthalmologist and the illuminating engineer. A few critical remarks, Le Grand H. Hardy
Discussion, Professor Selig Hecht (by invitation)
- VIII. EXECUTIVE SESSION
To vote on report of Committee on Fellowship requirements

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, December 22, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Value of the x-ray as an aid to diagnosis of cyanosis in the new born. Report of 5 cases, E. H. Dennen
 - b. Case of pernicious vomiting with death, Harbeck Halsted
- III. PAPER OF THE EVENING
The psychological duty of the obstetrician, Edmund B. Piper, Philadelphia (by invitation)
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION

SECTION OF OTO-LARYNGOLOGY

Wednesday Evening, December 23, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. End results in sinus surgery, E. Ross Faulkner
Discussion, Robert E. Buckley
 - b. A study of the incidence of nasal sinus disease in 386 cases of chronic arthritis with special reference to the cases in which it

acted as a silent focus of infection, S. Fineman, R. G. Snyder,
C. H. Traeger (by invitation)

Discussion, Lee M. Hurd, Blake F. Donaldson

III. EXECUTIVE SESSION

Election of Officers and Advisory Committee

For Chairman—Charles J. Imperatori

For Secretary—Marvin F. Jones

For members of Advisory Committee—

John R. Page (1 year)

Richard T. Atkins (2 years)

Westley M. Hunt (3 years)

Clarence H. Smith (4 years)

David H. Jones (5 years)

NOTE:—The day most available for section meetings is the third Wednesday of the month.

AFFILIATED SOCIETIES

NEW YORK PATHOLOGICAL SOCIETY

In Affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, December 10, at 8:30 o'clock

(Please note change of date)

I. PRESENTATION OF CASES ORDER

- a. Aortico-ventricular fistula with engrafted acute endocarditis, Mendel Jacobi, Abraham Heinrich
- b. Sarcoma-like tumor of pleura, Mendel Jacobi, Herman Bolker
- c. Mycotic aneurysms at the base of the aorta in an instance of sub-acute bacterial endocarditis, David Perla, Sam Rosen (by invitation)

II. PAPERS OF THE EVENING

- a. The histological distribution of lipoids in various lesions of the kidney: a preliminary report, Irving Graef, Henry Horn (by invitation)
- b. Endemic amebic dysentery in residents of New York City, Paul Klemperer

III. EXECUTIVE SESSION

NEW YORK MEETING

OF THE

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday, December 16, 1931, at 8:15 P. M.

- I. Influence of Secretions of the Upper Respiratory Tract on Tissue Resistance, F. M. Hanger
- II. Occurrence of Fatty Livers in Rats Fed a Diet Containing Dried, Whole Liver, N. R. Blatherwick, E. M. Medlar, P. J. Bradshaw, A. L. Post and S. D. Sawyer
- III. Immunological Differences Between a Strain of Monkey Virus and

- Human Poliomyelitis Virus, E. R. Weyer (introduced by W. H. Park)
- IV. "Slow-Motion" Cinematographs of the Contraction of Single Muscle Cells, C. M. Goss (introduced by S. R. Detwiler)
- V. Influence of Anesthesia upon Pancreatic Function, T. F. Zucker, P. G. Newburger and B. N. Berg
- VI. Therapeutic Value of Pneumococcus Type VII (Cooper) Serum, J. G. M. Bullowa
- VII. Differences in Bactericidal Power of Blood Within an Inbred Strain of Rats, M. R. Irwin and T. P. Hughes

NOTICE TO MEMBERS

It is desired that the program be printed in full in the Academy folder. To this end manuscripts should be in the Secretary's office by the first of the month.

THE NEW YORK ROENTGEN SOCIETY

In Affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Monday Evening, December 21, at 8:30 o'clock

ORDER

I. Demonstration of interesting cases and roentgenograms

A CLINICAL MEETING

II. EXECUTIVE SESSION

FELLOWS ELECTED JANUARY 7, 1932

Emanuel Appelbaum	50 West 96 Street
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George M. Lewis	200 West 59 Street
Philip D. McMaster.....	Rockefeller Institute
Louise H. Meeker.....	1245 Post Road, Scarsdale, N. Y.
Peter K. Olitsky.....	Rockefeller Institute
Thomas Parran, Jr.	Loudonville, N. Y.
Cornelius P. Rhoads	Rockefeller Institute
Adele E. Sheplar.....	282 West 4 Street
C. Jonathan Slocum	Beacon, N. Y.
E. Myles Standish	Hartford, Conn.
Jerome P. Webster	Bard Hall, 50 Haven Avenue
William Charles White.....	2139 Wyoming Avenue, Washington, D. C.

AND FOR ASSOCIATE FELLOWSHIP:

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W. J. V. Osterhout, Ph.D.....	Rockefeller Institute
Donald D. Van Slyke, Ph.D.....	Rockefeller I

DEATHS OF FELLOWS OF THE ACADEMY

CARTER STANARD COLE, M.D., 204 West 55 Street, New York City; graduated in medicine from the University of Virginia, Charlottesville, Va., in 1887; elected a Fellow of the Academy October 1, 1891; died, December 29, 1931. Dr. Cole was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the Alumni Association of New York Hospital and a member of the Alumni Association of City Hospital.

JAMES RIDDLE GOFFE, M.D., Bronxville, N. Y.; graduated in medicine from Bellevue Hospital Medical College, in 1881; elected a Fellow of the Academy February 3, 1887; died, December 24, 1931. Dr. Goffe was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, and a member of the American Gynecological Society. Dr. Goffe was at one time President of the American Gynecological Society and was President of the Seventh International Congress of Obstetricians and Gynecologists.

RAY ROBINSON LOSEY, M.D., 30 East 40 Street, New York City; graduated in medicine from the University of Nebraska, Lincoln, Neb., in 1918; elected a Fellow of the Academy April 1, 1926; died, January 1, 1932. Dr. Losey was a Fellow of the American Medical Association, a member of the County and State Medical Societies, Senior Assistant Surgeon to the New York Eye and Ear Infirmary, Ophthalmologist to the Broad Street Hospital, Midtown and Community Hospitals.

CHARLES AUGUSTE WILSON-PREVOST, M.D., 55 Avenue du Bois de Boulogne, Paris, France; graduated in medicine from The Faculty of Medicine of Paris, in 1897; elected a Fellow of the Academy November 5, 1914; died, December 19, 1931. Dr. Wilson-Prevost practiced in New York for a quarter of a century and once was a surgeon at the Post-Graduate Hospital.

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1931

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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VIII

FEBRUARY, 1932

No. 2

ANNUAL GRADUATE FORTNIGHT

Disorders of the Circulation

October 19 to 30, 1931

ARTERIOSCLEROSIS*

ROY WESLEY SCOTT

Professor of Clinical Medicine, Western Reserve Medical School

I undertake this discussion of human arteriosclerosis with a certain unwillingness, because as every student of the subject must appreciate, our ignorance of this very common affection far overshadows our knowledge. A search of past writings for established fact leads to disappointment; hypotheses there are in abundance, but these frequently express opposite views concerning the cause and nature of arteriosclerosis.

For the purpose of this discussion I exclude those changes in the arteries due to syphilis, tuberculosis, trauma, toxic agents leading to thrombosis, and that rather rare inflammatory process, periarteritis nodosa. With less justification perhaps we exclude also the medial necrosis and calcification of peripheral vessels, described by Mönckeberg. I shall use the older and better known term "arteriosclerosis" introduced by Lobstein to denote that most common affection of the arterial system, of undetermined etiology, rarely absent in advanced life, and characterized by a thickening of the intima accompanied by the deposition of fat. Changes in the media are usually mild, although in some instances they are marked. Later sclerosis and calcification occur, which give to the arteriosclerotic artery its most characteristic appearance.

*Delivered October 22, 1931.

To enter upon a discussion here of the anatomical changes in arteriosclerosis would carry us far afield and would be productive of nothing new. Whether the process is primarily in the intima or in the media, or whether it is inflammatory or degenerative in nature is not settled. Klotz thinks that the sclerotic changes in the vessels are due for the most part to intimal disease caused by infectious processes, work and old age, while McCallum has stated that the media in the aorta and visceral arteries seems relatively little changed in comparison to the extent of the intimal alterations. Included here are those changes in the smaller ramifications of the vascular tree known as arteriolar sclerosis. No attempt is made to differentiate this process from arterial sclerosis because the two are very frequently associated and so far as we now know they may have a common pathogenesis.

Arteriolar sclerosis affecting arterioles of the order of the vasa afferentia in the kidneys is characterized by the irregular deposition of hyalin under the endothelium as seen best in longitudinal sections of the arteriole. Such hyalinized areas may undergo a fatty change which can be demonstrated by lipid stains such as Sudan III. As the process advances the lumen of the vessel is narrowed or completely obliterated. In larger arterioles one sees only the hyperplastic type of intimal thickening with retrogressive and fatty changes and later proliferation of connective tissue. Often in advanced cases the media shows degenerative changes with complete replacement fibrosis. Medial hypertrophy of the kidney arterioles is seen particularly in individuals under forty dying of hypertension.

Reviewing the present day conceptions of the etiology and pathogenesis of arteriosclerosis, one finds much speculation and many hypotheses often masking as fact. In a review of the subject in 1922, McCallum stated: "Arteriosclerosis is one of those diseases difficult to explain because it develops so slowly through long years of life, during which a great many possible causes have had an opportunity to affect the tissues. Hence every conceivable idea

has been expressed or tenaciously maintained regarding the condition and many of them are so vague and ill supported that it is wearisome to discuss them. None, however, is clearly demonstrated to have a definite bearing on the etiology of arteriosclerosis and we are quite as ignorant of its underlying causes as were our fathers in the days of Morgagni."

Aware of the truth expressed in this quotation of McCallum, we find it difficult however to dismiss summarily from consideration certain factors which have long been thought to be of some significance in the cause of human arteriosclerosis. I refer to the influences of heredity, to the ravages of the ageing process, to hypertension (high blood pressure) and to those changes in our environment incident to our civilization, not because these are in any sense all the factors that may be involved, but the evidence in their favor is perhaps open to less criticism than that presented by other alleged etiological agents.

INCIDENCE OF ARTERIOSCLEROSIS

Accurate data on the present incidence of arteriosclerosis are not available, but indirectly, certain more or less pertinent facts are obtained by a study of mortality and morbidity statistics. These show for the registration area in America, first, that heart disease is the leading cause of death at present and, second, that the mounting incidence of heart disease during the past two decades occurs in individuals past forty years of age. For example, heart disease in the State of New York, excluding New York City, has been the leading cause of death since 1912 with the exception of the year 1918 when pneumonia held first place. The curves show an almost continuous rise from a rate of 133.5 in 1900 to 279.9 in 1928, when 50.6 per cent of the deaths were between the ages of forty and seventy, and only 8.3 per cent were under forty years of age. Assuming a certain error inherent in such data, there is little reason to doubt the statement that the most significant factors in heart disease beyond forty are vascular (blood vessel) decay, coronary arteriosclerosis, and those changes in the

smaller arterioles that we know are so frequently associated with hypertension (high blood pressure). If, in addition, we add that group of individuals beyond forty who die of cerebral arteriosclerosis (thrombosis or hemorrhage) and those dying of renal insufficiency (kidney disease) secondary to vascular disease, it is apparent that at the present time the expectancy of life of the majority of people beyond middle age is determined by the state of the arteries. Long ago it was said "A man is as old as his arteries." This truth is even more apparent today than ever before.

Much attention is given in some quarters to the steadily mounting morbidity and mortality rates from cardiovascular (heart and blood vessel) disease, and a variety of opinions is expressed concerning their significance; but before any definite conclusions are reached it is necessary to know much more than we do at present concerning many factors that appear to influence the incidence of arteriosclerotic changes in vessels.

Data on the life span show that there are today in this country more people fifty years of age than ever before. Only a few decades ago the age at which most people died was 45; now it is 60. The control of some of the important causes of death in infancy and childhood has increased the number of people past middle life—in the arteriosclerotic age—hence a certain natural increment in the incidence of vascular disease is to be anticipated. Furthermore, modern hygiene and preventive medicine are striving daily to increase the number of individuals (both fit and unfit) that mature to approach the involutionary period of senescence. Man is exercising more and more control over his environment and there are those who point with pride to his accomplishments in prolonging human life, but the Biologist and the Eugenist ponder the ultimate results of our present day methods as applied to the human race. They see the waning influence of natural selection and wonder if we can continue to thwart nature without paying the penalty in quality if not ultimately in quantity. In fact, there is some reason to believe that

nature is already exacting her toll. Professor Forsyth of Dartmouth has presented evidence to show that the length of life in this country is actually decreasing. From a critical analysis of mortality statistics he concludes that the American adult today cannot expect to live as long as his father or grandfather. There is little question that many individuals today are maturing to propagate the race who would not have survived in the more rigorous environment of our forefathers. If the wearing quality of our arteries is in any way determined by our heredity (a point emphasized by the late Dr. Osler) may we not expect an increasing number of people whose vessels may wear reasonably well for the earlier decades of life but as age comes on the shoddy appears in the form of early deterioration of the vascular system. It appears that this view, admittedly difficult either to prove or disprove, cannot in the light of our present knowledge be summarily dismissed as sheer speculation.

CLINICAL ASPECTS OF ARTERIOSCLEROSIS

Although we are far from a solution of the problem of the pathogenesis of human arteriosclerosis, valuable contributions to our knowledge have been made by both pathologists and clinicians in the days since Bright. Time will not permit a discussion of the voluminous literature that has grown up on the subject in the past century, but it is necessary to mention the contributions of a few workers who have been most responsible for our present day conceptions. These are not perfect and they are slowly changing, but there is little doubt that the informed clinician at present is much better equipped than were his predecessors of the past generation to appreciate the variety of clinical conditions either associated with or directly due to arteriosclerotic changes in the vascular tree.

Knowing as we now do the frequent association of hypertension and left ventricular hypertrophy with sclerotic changes in the intimate vasculature of several organs—most often the kidneys—it is not surprising that the early students of kidney disease should have been

concerned also with the problem of vascular disease. Bright observed the occurrence of thickened vessels and cardiac hypertrophy in patients with contracted kidneys, but he had no clear conception of the causal relation. To understand the origin of the term "Bright's Disease" and "Bright's Kidneys" and to appreciate the influence that these terms have had on moulding our views even to the present time, we should recall that Bright's work dealt with no particular form of renal disease but included all cases with an albuminous urine during life and a scarred kidney post mortem. Kidney lesions were no further classified by Bright than as "large and smooth" and "small and granular," exceptions being regarded as intermediate stages in the process of development from the large to the small kidney. Originally, therefore, the term Bright's Kidney included many forms of renal disease. It is interesting to note that following Bright's work and persisting for many years were certain conceptions regarding kidney disease which have done more to retard than to advance our knowledge. Chief of these were: First, that all types of scarred kidneys were manifestations of one disease process at different stages, and, second, that the associated lesions of other organs, such as those of the heart and arteries, were the effects of renal disease and due to progressive renal insufficiency.

It was not until some twenty years after Bright that the vascular lesions associated with renal disease received much attention. In 1852 Johnston showed that in one form of chronic Bright's Disease the smaller arteries not alone in the kidneys but also in other viscera were thickened—changes which he ascribed to antecedent renal disease. The contribution which marked an epoch in our knowledge of vascular disease was that of Gull and Sutton in 1872. They confirmed Johnston's observations, but took an important step forward by showing that a diffuse vascular disease of the smaller vessels (arteriocapillary fibrosis) may occur without serious renal damage. They further suggested that left ventricular hypertrophy was due

to the change in the minute arteries and capillaries and not to renal insufficiency. The observations and deductions of Gull and Sutton are all the more remarkable when we recall that they were made with imperfect histological methods and with no knowledge of clinical blood pressure. As conclusive as their work appeared, it was not a death blow to the older conceptions of the dependence of cardiac hypertrophy and arteriosclerosis upon renal disease.

About twenty years after the work of Gull and Sutton, the sphygmomanometer was introduced into clinical medicine by Von Basch. As clinical data on blood pressure gradually accumulated it was but natural that some association between abnormal elevations in blood pressure and sclerotic changes in vessels should be postulated, and supporting evidence for this view was afforded by those incidences of hypertension associated with demonstrable sclerosis of the accessible arteries. However, exceptions to the rule were not long in appearing. Von Basch in 1893, after observing many cases of hypertension without demonstrable arterial changes, concluded that the hypertension was but a precursor of arteriosclerosis and to designate such conditions he used the term "latent arteriosclerosis." Still lurking in the background now more than twenty years after Gull and Sutton's work, and more or less dominating the clinical thought of the time was the old teaching concerning the unity of arteriosclerosis and kidney disease. To bring the earlier observations on blood pressure into line with this view, it was taught that hypertension was a manifestation of arterial change which in turn resulted from renal disease. Therefore individuals with an abnormal elevation in blood pressure were regarded as having, or destined to develop Bright's Disease and renal insufficiency. Such was the generally accepted and almost universally taught hypothesis concerning the relationship between arteriosclerosis, blood pressure, and kidney disease, in the early 90's of the last century.

In retrospect we may say that the stage was set for recognition of that large group of individuals with chronic

hypertension who never develop renal insufficiency, and who have no significant changes in the palpable arteries. For this step forward we are indebted to Allbutt, although about the same time Huchard in France was aware of the frequency of non-nephritic hypertension. Long and careful observations on patients led Allbutt to the following well known classification: (1) Hyperpiesia—individuals with chronic hypertension with little or no renal involvement who die of heart failure or apoplexy. (2) Renal disease with or without hypertension. (3) Decrescent arteriosclerosis, primarily of the larger arteries, not necessarily accompanied by hypertension. In his zeal to stress the importance of hyperpiesia and to have it regarded as a distinct malady, Allbutt failed to recognize, or at all events did not include in his classification, those cases of primary hypertension that die of renal insufficiency. Such cases have until very recently presented a barrier to any classification of nephritis; they have led to no little confusion between clinicians and pathologists and have helped to keep alive the old conception of the renal origin of hypertension.

After Gull and Sutton, the most outstanding contribution from the pathological standpoint was made by Jores in 1904, who showed for the first time that the scarred kidney, formerly regarded as the seat of chronic interstitial nephritis, was in reality due to arteriosclerosis of the smaller renal vessels. He further observed that patients with atrophic granular kidneys had hypertrophied left ventricles, and more often died of cardiac failure or apoplexy. Jores' work supported that of Allbutt and served to emphasize the view that cardiac hypertrophy and hypertension were not due to renal involvement. Opponents on the other hand supported their argument by citing cases of hypertension that died of uremia. For several years following the work of Allbutt and Jores clinicians generally, recognized that some relationship existed between arteriosclerosis, hypertension, cardiac hypertrophy and granular kidneys, but, as most of us recall, the teach-

ing of twenty years ago was anything but clarifying. The diagnosis of cardiovascular renal disease was commonly made, but so far as the student was concerned, just what part of the clinical picture was due to cardiac failure and what to renal insufficiency was seldom determined with any degree of accuracy. Retained body fluid and an albuminous urine were usually sufficient evidence to incriminate the kidneys.

The clear recognition of two types of primary hypertension, one with renal insufficiency, the other without, and the corresponding vascular renal lesions were established by Volhard and Fahr in 1914. Thus for the first time the hitherto puzzling case of hypertension and renal insufficiency was brought into line, but not without an argument among pathologists which has continued to the present time. This arose from the assumption by Volhard and Fahr that the kidney lesions, particularly in the glomeruli, in their cases of so-called malignant hypertension dying of renal insufficiency, were not due solely to vascular damage but were a combination of vessel and inflammatory renal changes—their *Kombinations-Form*. Both authors have now changed their original views, Volhard holding that the vascular renal lesions are ischemic in nature, the result of vascular spasm. This phase of the subject is presented in a recent contribution of Klemperer and Otani, who distinguished two types of renal insufficiency in hypertensive patients, first, a slowly progressive one due to gradual stricture of the vascular bed with subsequent destruction of kidney parenchyma, and, second, the so-called malignant hypertension with rapidly developing renal insufficiency in which marked renal atrophy is absent. In this latter group Klemperer and Otani distinguish two types of vascular lesions, first, a rapidly progressive atherosclerosis and, second, an inflammatory lesion superimposed on an antecedent arteriosclerosis.

The above brief resume of a few of the more important contributions since Bright, gives us a glimpse of the development of our present knowledge concerning the rela-

tionship of arteriosclerosis, hypertension and certain forms of kidney disease, and it also indicates the difficulties encountered in the past in correlating clinical and pathological observations. That our present knowledge is immature is apparent to all, but may not its abundant heritage promise much for the future?

Before attempting what we may call a pathological-physiological classification of arteriosclerosis, certain well known facts may be emphasized: First, that those changes in the arterial tree that we call arteriosclerosis are most capricious in their distribution, appearing in the greater circulation from the Sinus of Valsalva to the smallest arterioles (for some reason not known at present the arteries of the lesser circulation in most cases are singularly spared); the process may be generalized in some instances and sharply localized in others. Second, that the functional significance of arteriosclerosis varies greatly—often there is no parallelism between the extent of the process and the associated functional disturbances. For instance, we see extensive changes in the larger arteries that offer no barrier to longevity, and on the other hand, the process may be confined to a few millimeters of the coronary artery and cause sudden death in the prime of life. Serious damage to the intimate vasculature of the kidney is found in young people dying of uremia. Chronic hypertension and sanguineous apoplexy usually are associated with damaged cerebral vessels. Many other examples might be cited to illustrate the variety of clinical pictures associated more or less intimately with vascular disease. Our limited knowledge at present precludes a satisfactory classification of arteriosclerosis (this term to include both large and small vessel involvement), but since we as clinicians are primarily concerned in correlating the clinical and pathological findings, the following scheme may serve as an outline in approaching a discussion of the subject:

Arteriosclerosis (large arteries)

Without Hypertension

- | | | | |
|-----------------------|--|--|--|
| (1) Coronary Arteries | { Stenosis (ischemia)
Thrombosis | { Angina Pectoris
Myocardial Insufficiency | |
| (2) Cerebral Arteries | { Stenosis (ischemia)
Thrombosis
Rupture | { Mental Deterioration
Apoplexy
Paralysis | |
| (3) Renal Arteries | { Ischemia
Necrosis
Infarction | { Scarred { very rarely
Kidney { insufficient | |
| (4) Aorta | { Inelasticity
with or without dilatation
Calcification of Aortic Valves | { Periphleural
Circulatory Disturbances
(Stenosis)
Myocardial Insufficiency | |

Arteriosclerosis (arterioles)

*Often combined with large vessel sclerosis
With Hypertension and Cardiac Hypertrophy*

- | | | | |
|-------------|--|---|--|
| (5) Heart— | { Dilatation
Coronary Disease
as in (1) | { Myocardial Insufficiency
Angina Pectoris | |
| (6) Brain— | { Vascular Changes
as in (2) | { Mental Deterioration
Apoplexy
Paralysis | |
| (7) Kidney— | { Vessel Sclerosis
with or without Arteriole Necrosis | { Often Granular Atrophy
Uremia in approximately 10% | |

This outline makes no claim to perfection and it has many vulnerable spots. To perceive them is to appreciate the difficulties in associating functional disorders and anatomical changes, particularly changes so irregular in distribution as are those of arteriosclerosis. Certain quite obvious objections may be made to the association of arterial and arteriolar sclerosis and blood pressure, but in indicating a relationship between hypertension for example and small vessel disease, no more is implied than the fact, that most individuals with so-called essential hypertension show at post mortem more or less marked lesions of the arterioles. We have no proof that the arteriolar lesions are the cause or the result of hypertension and no such implication is intended in this outline. As a matter of fact there are authorities who uphold either view.

Lesions of the arterioles are found in the order of frequency and severity in the kidney, spleen, pancreas, liver, brain and gastro-intestinal tract. Keith and associates at the Mayo Clinic recently have published observations on the arteriolar lesions in the skeletal muscles in cases of hypertension. This work seems promising but more data are necessary before definite conclusions can be drawn. The occurrence of large vessel sclerosis without hypertension as shown here is also open to criticism because of the frequent involvement of the arteries as well as the arterioles in individuals with hypertension. On the other hand, one finds it necessary to include that large group of elderly people who have outspoken arteriosclerosis of the large arteries with no undue elevation in blood pressure. Certain it is that there is not the obligate connection between large vessel sclerosis and hypertension that we know exists between small vessel disease and hypertension. For this reason there appears some justification for indicating the relationship as shown here. The right side of this diagram showing items 5, 6, and 7 under "Small Arteries" and in relation to hypertension is a functional grouping emphasizing a fact well established at present, namely,

that the cause of death in individuals with primary or essential hypertension is in the order of frequency: heart failure, a cerebral accident and renal insufficiency. In a series of 400 autopsied cases of essential hypertension, Bell and Clawson found myocardial insufficiency including coronary disease, responsible for sixty per cent of the deaths. In a similar series of 100 autopsied cases at the Cleveland City Hospital we found as the cause of death myocardial failure in sixty-eight per cent, cerebral accident in twenty-two per cent, and renal insufficiency in ten per cent. Allowing for certain errors inherent in such data, they show that the most common contingency in essential hypertension is heart failure, and by all odds the least is renal insufficiency. These facts are not as widely appreciated as their significance merits. The old conception of the renal origin of hypertension still survives to influence diagnosis and the therapeutic management of patients. Red meat is still prohibited and a failing heart is neglected because an albuminous urine is regarded as Bright's Disease rather than as chronic passive congestion. The appearance of coronary arteriosclerosis in two positions in this diagram illustrates again the difficulty in correlating anatomical changes and functional disorders. Anatomically the coronaries are large arteries and from a functional standpoint coronary sclerosis occurs in patients without hypertension, but it also is associated frequently with small vessel disease and hypertension. Indeed, more or less coronary arteriosclerosis is almost always found in hypertensive heart failure, so that, in a scheme such as this, it must appear on the one hand associated with hypertension, and on the other hand without hypertension. For the same reason, we must include cerebral arteriosclerosis under the two headings. The arrangement in 5 under "Small Arteries" is made to indicate, first, that coronary arteriosclerosis frequently occurs and is often an important factor in hypertensive heart failure, and, second, that as a result of coronary disease the clinical picture in hypertension may be that of Heberden's Angina Pectoris or coronary thrombosis. In 6 we see the second

most common cause of death in hypertension—a cerebral accident due to a ruptured cerebral artery or to thrombosis of a sclerotic vessel. Under 7 we include that group (approximately ten per cent) of the cases of hypertension that die of renal insufficiency. Here we may distinguish two general types, one of long standing hypertension—a slowly progressive vascular lesion in the kidney with renal atrophy and ultimate insufficiency—the other a more rapidly developing vascular lesion, usually in younger individuals, with little or no renal atrophy, and death in uremia. In group 7 are included those instances of granular atrophy of the kidney secondary to vascular lesions, so commonly found at autopsy in hypertensive patients. Such forms of renal scarring which up to a few years ago were called chronic interstitial nephritis we now know, seldom lead to renal insufficiency. In other words, from eighty-five to ninety per cent of patients with essential hypertension and arteriolar sclerosis die of heart failure or a cerebral accident before the vascular lesion in the kidney progresses to the point of renal insufficiency. The left half of this outline is made to include those instances, usually in elderly people, of widespread and often extensive changes in the larger arteries without hypertension. Here reference is made to four large arterial systems, because the functional disturbances associated with changes in these vessels often lead to fairly distinct clinical pictures. For example, coronary arteriosclerosis is seen as the anatomical basis for certain cases of myocardial fibrosis and functional insufficiency, for instance of angina pectoris and coronary thrombosis in patients who have never had hypertension. Also the mental deterioration in encephalomalacia from cerebral arteriosclerosis is well known, as is also the apoplectic stroke and paralysis.

The kidney is so often scarred in arteriosclerosis of the larger arteries that we include it under (3). Changes in the larger vessels of the kidney often lead to occlusions with atrophy of kidney substance. This causes the irregular pitting so often seen in the senile kidney. Such

changes, however, seldom cause atrophy of sufficient kidney parenchyma to lead to functional insufficiency.

Sclerosis of the aorta may be extreme and yet cause no symptoms. However, as the vessel approximates rigidity the pulse is more rapidly propagated to the periphery, as shown by Bramwell and Hill. More of the shock of ventricular systole is transmitted peripherally and we find an abnormal excursion of the vessels from the aortic arch, for example the carotids. Sclerotic changes at the root of the aorta not infrequently involve the valve cusps, which become rigid, are unable to approximate the aortic wall during systole, and may lead to a high grade of aortic stenosis and death from heart failure. Incidences of aortic insufficiency ascribed to arteriosclerosis are often due to syphilis which may not be recognized grossly in the presence of advanced arteriosclerosis. Mention here may be made of an interesting anatomical finding first called to my attention by Professor Erdheim. He points out that the first few centimeters of the aorta are singularly spared in individuals who attain seventy years or more, although the remainder of the vessel is more or less extensively diseased. On the other hand, marked involvement of the first 3 to 4 centimeters appears to be incompatible with the proverbial three score and ten years. Exceptions to this rule are very rare. In searching for some explanation of this fact, one is reminded of the evidence indicating that the first part of the aorta is nourished from the coronary arteries, so that it is possible some relationship between coronary disease, at least of those branches that supply the aortic root, and sclerosis in this region exists. This matter merits further study.

The reference to combined lesions, as indicated in the right half of this diagram, is of course absolutely necessary, since several combinations of functional and anatomical changes may occur. For example, the larger arteries are almost always involved in long standing cases of hypertension and, indeed, the clinical course may be dominated entirely by the large vessel disease.

At this point I desire to present briefly the salient clinical and pathological findings in one case which illustrates the extent of the problem of vascular disease. Those of you who attended the Cleveland meeting of the American College of Physicians in 1927, will recall a boy aged twelve years whom I demonstrated as an example of juvenile non-renal hypertension.

This boy developed normally and except for an attack of lobar pneumonia at age eight, he was in good health until eleven years of age. There was no history of rheumatic infection or scarlet fever. One year before coming under our observation he noticed undue breathlessness and palpitation while at play. He complained also during this year of rather regularly recurring attacks of severe headache. These symptoms progressed and formed the chief complaint on admission to the hospital, January 20th, 1927.

Physical examination revealed a well developed and alert boy of good color, in no distress, and with no puffiness about the face or edema elsewhere. Blindfolded, one would have said from palpation that the accessible arteries were those of an old man. They were hard and tortuous and it was apparent that the blood pressure was elevated, and when measured it was found to be 280 mm. of mercury systolic, and 175 diastolic. At a glance one was impressed by the vigor and position of the cardiac impulse, which was maximum in the sixth left intercostal space, extending almost to the anterior axillary line. At the apex the heart sounds were loud and booming, but as one approached the base a loud diastolic murmur was audible, with maximum intensity over the manubrium. In this position one also heard a snappy and tympanitic second sound followed at once by the blowing diastolic murmur. It was thought that this murmur was due to relative incompetence of the aortic valves, as it entirely disappeared when the systolic blood pressure was lowered from 280 to 190 by the administration of nitro-glycerine. It is

of note also that this acute drop in blood pressure always caused a severe headache.

The eyegrounds were typical of hypertensive retinitis. Neither disc was discernible from swelling of the adjacent retina. There were numerous areas of recent hemorrhage and a few whitish spots were observed. Only a few retinal arterioles were visible. These showed marked sclerosis. Further clinical study of the case revealed a normal blood picture, hemoglobin 90 per cent with 4.3 million red blood cells per cubic-millimeter. The blood urea nitrogen on several occasions varied between 40 and 60 mgm. per 100 c.c. The urine was pale and the specific gravity varied between 1.010 and 1.015. It always contained albumin and the sediment showed a few casts. The phthalein output was 50 per cent in two hours.

During the first month in the hospital, the symptoms complained of on admission improved, and the child appeared so well that his parents insisted upon taking him home. Two weeks later, and while at home, he developed suddenly a right sided hemiplegia with the signs of an upper neurone lesion of the seventh nerve. Two days afterwards he was readmitted to the hospital, but no improvement in his condition occurred. His paralysis continued, he became more and more lethargic, and expired on April the 5th, two and a half months after his first admission. The anatomical diagnosis was as follows: Marked Generalized Arteriosclerosis; Arterial and Arteriolar Sclerosis of Kidneys; Cardiac Hypertrophy (weight 475 grams); Massive Cerebral Hemorrhage, Left; Hemorrhagic Infarcts of Intestines; Acute Splenic Hyperplasia; Edema of Lungs. Microscopically, arteriolar lesions were demonstrated in the kidneys, liver, spleen and pancreas. For the following histological description of the kidney lesions I am indebted to my colleague Dr. Harry Goldblatt. One of the striking features is the relative absence of glomerular lesions. An occasional glomerulus shows fatty degeneration or focal hyalinization of the tuft, with or without adhesion to the capsule. The most striking pathological

change affects the blood vessels and especially the interlobular and afferent vessels. In the larger arterioles there is mainly thickening of the intima due to cellular proliferation. In the smallest ones the thickened, proliferated intima shows patchy or complete hyalinization with or without fatty degeneration; which shows well in sections stained with Sudan III. The media of the smaller vessels is definitely hypertrophic, but in most instances shows no other pathological change. The vascular lumen is in all instances reduced in size and in many of the vessels it is completely obliterated.

From the above account we see a case of extensive and severe diffuse vascular disease with hypertension and death from a cerebral hemorrhage, in a boy of twelve years. Certainly we cannot invoke the ageing process, and there is little evidence that infection played an etiological rôle in the production of the vessel disease in this case.

In summary form we may say that the present day clinician sees in human arteriosclerosis a pathological process affecting the arterial system of the greater circulation from the largest to the smallest vessels, usually insidious in its onset, and most irregular in its distribution. Its pathogenesis is an unsolved problem, but in speculating we turn to the influence of such factors as heredity, the ageing process, hypertension, and those changes in our environment incident to modern civilization. When we know more about the causes of essential hypertension we will be farther on the road to the solution of the problem of arteriosclerosis, particularly the form that involves the smallest vessels, the arterioles.

We have seen that statistics indicate a mounting incidence of vascular decay, particularly in middle life, but we are reminded of the fact that individuals are living longer today than ever before and deterioration of the arteries appears to be a favorite method of nature to eliminate us after our biological responsibilities have been fulfilled. Complicating the problem and exerting an influence diffi-

cult to evaluate, are our present day efforts to thwart the law of natural selection.

One is reminded of the proverb, "So long as more remains to be done, nothing seems done." However, the canvas is being painted, a high light here, a shadow there, and if we are at present forced to speculate on the appearance of the final picture, we should be stimulated rather than deterred in our efforts to solve one of the most important and most perplexing problems with which the clinician and pathologist have to deal—the problem of vascular disease.

A LIST OF WRITINGS ON THE CARDIOVASCULAR
SYSTEM EXHIBITED DURING THE
GRADUATE FORTNIGHT OF THE
NEW YORK ACADEMY OF MEDICINE, 1931

Arranged by
DR. CHARLES K. FRIEDBERG
and the Staff of the Library.

In connection with the program of the Graduate Fortnight on the cardiovascular system and its disturbances, organized by The New York Academy of Medicine in October, 1931, an exhibit was arranged of books and articles epitomizing the historical development of this subject. The more valuable volumes and single articles were opened at significant illustrations or paragraphs, and placed in closed glass cases with an associated card of explanation. More general volumes such as reference books, textbooks on heart disease, and books on special branches of the subject, were exhibited on open book shelves where they were easily accessible to visiting physicians. The books and articles on the open and in the closed shelves were demonstrated and discussed by the exhibitor.

Because of limitations of space it was impossible to include all the important works contributing to progress in cardiovascular disease. Availability and special interest were often the determining factors in choice of material. Related subjects such as hypertension, thyroid heart, etc., were omitted because of restricted space and because it is planned to consider these subjects in greater detail at future graduate fortnights.

In the preparation of the exhibit we wish to acknowledge our thanks to Dr. Fielding H. Garrison and Dr. Emanuel Libman for numerous valuable suggestions. We wish to acknowledge our indebtedness also to Sir Humphry Rolleston's Harveian Oration (1928) on "Cardiovascular disease since Harvey's discovery," H. L. Flint's

"The heart: old and new views," (1921), and R. O. Moon's "Growth of our knowledge of heart disease," (1927), for bibliographic material. We want to thank Dr. Emanuel Libman and Dr. Eli Moschcowitz for the loan of several volumes.

C. K. FRIEDBERG.

EARLY HISTORY

SINGER, CHARLES JOSEPH (1876-).

The Evolution of Anatomy.

London, K. Paul . . ., 1925.

The illustrations opposite page 3 show paleolithic drawings of elephant and Magdalenian drawings of bison indicating position of the heart.

HIPPOCRATES (B. CA. 460 B. C.).

Oeuvres complètes . . . Traduction nouvelle . . . par E. Littré.

Paris, Baillière, 1839-1861. 10 v.

Vol. VI opened at p. 44-45 in section on the nature of man: when life was seen to ooze away in wounded people, the blood was naturally mistaken for the soul of man.

ARISTOTELES (CA. 384-322 B. C.).

De Animalibus . . . Translated [into Latin] by Theodorus Gaza.

Venice, Johannes de Colonia & Johannes Manthen [de] Gherretzem, 1476.

A beautiful copy of one of the finest volumes from the press of these noted printers. Opened at passages indicating that unlike Hippocrates who regarded the brain as the seat of sensation, Aristotle located this in the heart which he viewed as the "Acropolis of the body" (De Partibus Animalium, III).

GALEN (CA. 129-200 A. D.).

De Naturalibus Facultatibus. Vol. II of Kühn's Medicorum Graecorum Opera . . . Leipzig, Cnobloch, 1821.

Describes, p. 208-209, the ventricular septum which he believed contained minute pores through which the blood is attracted from the right to the left ventricle during diastole.

PAGEL, JULIUS LEOPOLD (1851-1912).

Einführung in die Geschichte der Medizin.

Berlin, Karger, 1915.

Diagram of the Galenic circulation, p. 121. Note particularly the direct communication of right and left ventricles by a permeable septum, and the vessels passing directly from the liver (c) to the rest of the body as well as back to the heart.

HIPPOCRATES (B. CA. 460 B. C.).

Oeuvres complètes . . . Traduction nouvelle . . . par E. Littré.

Paris, Baillière, 1839-1861. 10 v.

Vol. IX opened at p. 83 in section on the Heart: "The heart is a muscle."

DEVELOPMENT OF ANATOMICAL KNOWLEDGE.

DA VINCI, LEONARDO (1452-1519).

Quaderni d'Anatomia.

Christiania, Dybwad, 1911-1916. 6 v.

Famous drawings of cardiac structures. (Originals now in Windsor Castle). Contains accurate descriptions and drawings of cardiac valves (Vol. II opened at folio 8 verso). Belief in permeability of septum indicated by drawings exhibited in Vol. I, folio 3 recto. Da Vinci stated, however, that the pores were invisible. Drawings include illustration of the moderator band.

VESALIUS, ANDREAS (1514-1564).

De Humani Corporis Fabrica. First edition.

Basle, ex off. Oporini, 1543.

Inauguration of the renaissance of Anatomy. In Book VI, Chapter xi, p. 567 (see figure), he describes the thick ventricular septum and expresses doubt as to its permeability. Uses term "mitral" for left auriculo-ventricular valve. Gives diagnosis between thoracic and abdominal aortic aneurysms. This valuable copy exhibited was given to the Academy by Sir William Osler.

FABRICIUS AB AQUAPENDENTE, HIERONYMIUS (1537-1619).

De Venarum Ostiolis.

Padua, L. Pasquati, 1603. Bound with his Opera anatomica, Padua, Meglietti, 1625.

1603 edition exhibited to show drawing of valves in the veins (Tabula Prima). These had earlier been discovered by Canano and Estienne (1551) but first delineated by Fabricius in 1574.

LOWER, RICHARD (1631-1691).

Tractatus de Corde item de Motu et Colore Sanguinis et Chyli in eum Transitu . . .

Amsterdam, D. Elzevir, 1669.

Described the structure of the heart more accurately than ever before. Pointed out the heart was a muscle. Described the arch of the aorta. (Drawings of this exhibited). Showed by insufflation of lungs that the red color of the blood in the aorta depended upon the inspired air. The copy exhibited was kindly lent by Dr. E. Moscheowitz, to show an early edition. The Academy also has a copy of this. "The London ed. of this year is usually quoted as the first." (*Bibl. Osler.*).

MALPIGHI, MARCELLO (1628-1694).

Opera Omnia.

Leyden, P. Vander Aa, 1687. 2 v. in 1.

Note *De Pulmonibus Epistola* II, p. 327, for microscopic demonstration of the capillary circulation in the frog's mesentery. Opened at drawings opposite p. 331.

THIERESICUS, ADAM CHRISTIANUS (1686-1732).

De Circulo Sanguinis in Corde.

Leyden, Potuliet, 1740.

Description (1708) of the coronary circulation including the vessels named after the author. Opened to show figures at the end of Book 3.

HENLE, FRIEDRICH GUSTAV JACOB (1809-1885).

Allgemeine Anatomie.

Leipzig, Voss, 1841.

Description of arterial endothelium, illustrated by drawing in Figure 3, Plate 1 at end of volume.

RENAK, ROBERT (1815-1865).

Ueber den Bau des Herzens.

Arch. f. Anat., Physiol. u. wissenschaft. Med., p. 76-78, 1850.

Description of the layers of muscle fibres in the heart and of its intrinsic ganglia.

MACCALLUM, JOHN BRUCE (1876-1906).

On the Muscular Architecture and Growth of the Ventricles of the Heart. In: Contributions to the Science of Medicine, dedicated . . . to William Henry Welch . . . p. 307-335.

Baltimore, Johns Hopkins Press, 1900.

Opened at p. 328 to show figure of structure of fibres in heart muscle.

GROSS, LOUIS (1895-).

The Blood Supply to the Heart.

New York, Hoeber, 1921.

The classical work on this subject.

CONDUCTION SYSTEM.

KENT, ALBERT FRANK STANLEY (1863-).

Researches on the Structure and Function of the Mammalian Heart.

J. Physiol., XIV: 233-254, 1893.

Description of the auriculo-ventricular bundle in mammals. Opened at figure on p. 244.

HIS, WILHELM, JR. (1863-).

Die Thätigkeit des embryonalen Herzens und deren Bedeutung für die Lehre von der Herzbewegung beim Erwachsenen.

Arbeiten aus der Medizinischen Klinik zu Leipzig, 1893. p. 14-49.

Leipzig, Vogel, 1893.

Description of the auriculo-ventricular bundle in the human embryo and other mammals. Opened at drawings on p. 22-23. Note also description at top of p. 23. This volume is a notable one in cardiovascular bibliography.

KEITH, (SIR) ARTHUR (1866-) and FLACK, MARTIN WILLIAM (1882-).

The Form and Nature of the Muscular Connections between the Primary Divisions of the Vertebrate Heart.

J. Anat. & Physiol., XLI: 172-189, 1906-1907.

Description of the sino-auricular node. Opened at figure on p. 181.

TAWARA, SUNAO ().

Das Reizleitungssystem des Säugetierherzens.

Jena, Fischer, 1906.

A complete account of the conduction fibres of the heart. Opened at Taf. VI.

PHYSIOLOGY.

SERVETUS VILLANOVANUS, MICHAEL (1509-1553).

De Restitutione Christianismi.

Nuremberg, Rau, 1790. Reprinted for Christoph Gottlieb von Murr, from the 1553 edition printed in Vienne, France, by Balthasar Arnollet.

Opened at p. 170. First accurate description of the lesser circulation. "1546. Earliest known form of the passage on the circulation by S. Represented by the MS., not in handwriting of Servetus, now in the Bibliothèque Nationale, Paris . . ." (Leonard L. Mackall, Servetus Notes, reprinted from Contributions to Medical and Biological Research, Dedicated to Sir William Osler . . . New York, Hoeber, 1919.) Only 3 copies of the original 1553 edition remain.

CAESALPINUS, ANDREAS (1520-1603).

Peripateticarum Quaestionum Libri Quinque.

Venice, Juntas, 1571.

Card exhibited gives reference to the denial by Caesalpinus that the vena cava originates from the liver. (Original not seen).

Quaestiones Medicae.

Venice, Juntas, 1593.

Card exhibited gives reference to the proof by Caesalpinus that veins carry blood *to* and *not from* the heart, made by demonstrating swelling of extremity distal to a ligature of a vein. (Original not seen).

HARVEY, WILLIAM (1578-1657).

Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus.

Frankfort, G. Fitzer, 1628.

Rare first edition bequeathed to the Academy by Dr. Walter James. Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus, with English Translation and Annotations, by Chauncey D. Leake.

Springfield and Baltimore, Thomas, 1928.

Terecentennial edition.

An Anatomical Dissertation upon the Movement of the Heart and Blood in Animals being a Statement of the Discovery of the Circulation of the Blood. Facsimile Reproduction with Translation and Memoir.

Canterbury, G. Moreton, 1894.

Prelectiones Anatomiae Universalis. Edited with an Autotype Reproduction of the Original by a Committee of the Royal College of Physicians of London.

London, Churchill, 1886.

This volume was kindly lent for the exhibit by Dr. E. Mosecowitz. The Academy also has a copy.

WILD, F. () (Ludwig's Laboratory).

Ueber die peristaltische Bewegung des Oesophagus, nebst einigen Bemerkungen über diejenigen des Darms.

Ztschr. f. rat. Med., V: 76-132, 1816.

Opened at p. 77 for first perfusion of the isolated heart.

RINGER, SYDNEY (1831-1910) and BIXTON, DUDLEY WILMOT ().

Concerning the Action of Small Quantities of Calcium, Sodium and Potassium Salts upon the Vitality and Function of Contractile Tissue and the Cuticular Cells of Fishes.

J. Physiol., VI: 154-161, 1885. See also vols. III and IV of this journal.

Ringer perfected Ludwig's method of keeping extravital tissues alive by showing the importance of calcium, sodium and potassium for muscular contraction. Ringer's solution.

LUDWIG, CARL FRIEDERICH WILHELM (1816-1895).

Lehrbuch der Physiologie des Menschen.

Leipzig & Heidelberg, Winter, 1852-1856. 2 v. See also Arch. f. Anat., Physiol. u. wissenschaft. Med., VI: 242-302, 1847.

Volume II opened at p. 85 to show illustration of float and kymograph for recording graphically the results of physiological experiments.

MAREY, ÉTIENNE JULES (1830-1901).

Physiologie médicale de la circulation du sang.

Paris, Delahaye, 1863.

Opened at page 54 to show Marey's tambours.

VOLKMAN, ALFRED WILHELM (1800-1877).

Die Hämodynamik.

Leipzig, Breitkopf & Härtel, 1850.

Opened at p. 138. First attempt at direct measurement of blood velocity by a U-shaped glass tube filled with salt solution, introduced into an artery. Improved by Ludwig in his stromuhr.

DOGIEL, J. (Ludwig's Laboratory).

Die Ausmessung der strömenden Blutvolumina.

Ber. ü. d. Verhandl. der K. Sächs. Gesellsch. der Wissensch. zu Leipzig, Math.-Phys. Classe, XIX: 200-275, 1867.

Measurement of blood velocity by the stromuhr. Opened at illustration on p. 202.

REIN, HERMANN ().

Die Thermo-Stromuhr.

Ztschr. f. Biol., LXXXVII: 394-418, 1928.

Measurement of the velocity of the blood stream by thermo-electric method.

TRAUBE, LUDWIG (1818-1876).

Ueber periodische Thätigkeits-Aeusserungen des vasomotorischen und Hemmungs-Nervencentrums.

Centralbl. f. d. med. Wissensch III: 881-885, 1865.

Traube-Hering Curves. Rhythmic variations in the tonus of the vaso-constrictor center.

BOWDITCH, HENRY PICKERING (1840-1911).

Über die Eigenthümlichkeiten der Reizbarkeit, welche die Muskelfasern des Herzens zeigen.

Ber. ü. d. Verhandl. d. K. Sächs. Gesellsch. der Wissensch. zu Leipzig, Math.-Phys. Classe, XXIII: 652-689, 1871.

"All or none" property of cardiac contraction. Opened at p. 687, paragraph 2.

LUCIANI, LUIGI (1842-1919).

Eine periodischë Function des isolirten Froschherzens.

Ber. ü. d. Verhandl. d. K. Sächs. Gesellsch. der Wissensch. zu Leipzig, Math.-Phys. Classe, XXV: 11-94, 1873.

"Treppe" phenomenon. Opened at figure on p. 19.

FRIEDENTHAL, HANS (1870-).

Ueber die Entfernung der extracardialen Herznerven bei Säugethieren.

Arch. f. Physiol., Leipzig, 1902, 135-145.

Proof of autonomy of heart muscle by elimination of the extracardiac nerves. Opened at p. 143, first paragraph.

KEITH, NORMAN MACDONNELL (1885-), ROWNTREE, LEONARD GEORGE (1883-) and GERAGHTY, JOHN T. ().

A Method for the Determination of Plasma and Blood Volume.

Reprinted from Arch. Int. Med., XVI: 547-576, 1915.

Use of vital red.

STARLING, ERNEST HENRY (1866-1927).

The Linacre Lecture on the Law of the Heart, given at Cambridge, 1915.

London, Longmans, Green, 1915.

Description of the heart-lung preparation and promulgation of the law of the heart. Opened at p. 6 to show diagram of apparatus and set-up.

GROLLMAN, ARTHUR (1901-).

The Determination of the Cardiac Output of Man by the Use of Acetylene.

Am. J. Physiol., LXXXVIII: 432-445, 1929.

BLOOD

HEWSON, WILLIAM (1739-1774).

Experimental Inquiries: Part the First, Containing an Inquiry into the Properties of the Blood with Remarks on Some of its Morbid Appearances.

London, J. Johnson, 1780.

See Chapter I for causes of coagulation of the blood.

HASSENFRATZ, M. ().

Mémoire sur la combinaison de l'oxygène avec le carbone & l'hydrogène

du sang, sur la dissolution de l'oxygène dans le sang, & sur la manière dont le calorique se dégage.

Ann. de chim., Paris IX: 261-274, 1791.

Internal respiration.

HOPPE-SEYLER, ERNST FELIX IMMANUEL (1825-1895).

Ueber das Verhalten des Blutfarbstoffes im Spectrum des Sonnenlichtes.

Virchow's Arch. f. path. Anat., XXIII: 416-456, 1862.

Spectroscopic studies of hemoglobin.

Ueber die chemischen und optischen Eigenschaften des Blutfarbstoffs.

Virchow's Arch. f. path. Anat., XXIX: 233-235, 1864.

HAMMARSTEN, OLOF (1811-).

Undersökningar af de s. k. Fibringeneratorerna Fibrinet Samt Fibrinogenets Koagulation.

Upsala Läkaref. förh., XI: 538-579, 1875-1876.

Fibrinogen and coagulation of the blood.

BOHR, CHRISTIAN (1855-1911), HASSELBACH, K. () and KROGH, AUGUST.

Ueber einen in biologischer Beziehung wichtigen Einfluss, den die Kohlensäurespannung des Blutes auf dessen Sauerstoffbindung übt.

Skandinav. Arch. f. Physiol., XVI: 402-412, 1904.

Relation of carbon dioxide tension to oxygen combining power of the blood.

OSLER, (SIR) WILLIAM (1849-1919).

Bizzozero's New (?) Blood Element and Its Relation to Thrombus Formation. (See Centralbl. f. d. med. Wissensch., Jan. 14, 1882).

Med. News, XL: 250, 1882.

Description of blood-platelets. Osler had made a preliminary communication in 1873 (Centralbl. f. d. med. Wissensch., XI: 577-578, 1873.)

CARDIAC NERVES.

BEZOLD, ALBERT V. (1836-1868).

Untersuchungen über die Innervation des Herzens.

Leipzig, Engelmann, 1863.

I. Influence of the vagus on cardiac activity.

II. Influence of the cervical sympathetic on cardiac activity.

CRON, ÉLIE DE (1843-).

Les nerfs du coeur, anatomie et physiologie.

Paris, Alcan, 1905.

WEBER, ERNST HEINRICH (1795-1878) and WEBER, EDUARD FRIEDRICH (1806-1871).

Ann. Univ. di Med., Milano, 3 s., XX: 227, 1845.

Card exhibited gives reference to demonstration of inhibitory action of vagus nerve and cardiac standstill as a result of stimulation of the vagus endings. (Original not seen).

CAPILLARIES.

LOMBARD, WARREN PLIMPTON (1855-).

The Blood Pressure in the Arterioles, Capillaries and Small Veins of the Human Skin.

Am. J. Physiol., XXIX: 335-362, 1911-1912.

Use of the capillary microscope.

DALE, HENRY HALLETT (1875-) and RICHARDS, ALFRED NEWTON (1876-).

The Vasodilator Action of Histamine and of Some Other Substances.

J. Physiol., LII: 110-165, 1918-1919.

KROGH, AUGUST.

The Anatomy and Physiology of Capillaries.

New Haven, Yale University Press, 1929.

LEWIS, (SIR) THOMAS (1881-).

The Blood Vessels of the Human Skin and Their Responses.

London, Shaw & Sons, 1927.

BLOOD PRESSURE.

HALES, (REV.) STEPHEN (1677-1761).

Statistical Essays, Containing Haemastatics . . .

London, Innys and Manby, 1731-1733. 2 v. First edition.

Direct measurement of blood pressure by a pipe inserted into the femoral artery.

POISEVILLE, JEAN LÉONARD MARIE (1799-1869).

Recherches sur la force du cœur aortique.

Paris, Didot le Jeune, 1828. Thesis No. 166.

Use of the U-shaped tube with mercury for direct blood pressure measurement instead of the straight tube of Hales.

BASCH, SAMUEL SIEGFRIED KARL (1837-1905).

Der Sphygmomanometer und seine Verwerthung in der Praxis.

Reprinted from Berl. klin. Wchnschr., XXIV: 179-183; 206-208; 224-226; 244-246; 285-286, 1887.

Development of a small clinical sphygmometer based on Vierordt's idea of measuring blood pressure without opening the artery, by applying weights over the artery until pulsation ceased.

MARTIN, (SIR) CHARLES JAMES (1866-).

The Determination of Arterial Blood Pressure in Clinical Practice.

Brit. M. J., I: 865-870, 1905.

Improvement of Riva-Rocci's sphygmomanometer based on Marey's instrument (1876) which constricted the whole limb until pulsation ceased instead of pressing upon a limited portion of the artery.

FELLNER, BRUNO, JR. ().

Neuerung zur Messung des systolischen und diastolischen Druckes.

Verhandl. d. Kong. f. innere Med., XXIV: 404-407, 1907.

Use of the stethoscope in determining blood pressure, first suggested by Korotkow (1905) and first used clinically by Krylow.

KRIES, N. v. ().

Ueber den Druck in den Blutcapillaren der menschlichen Haut.

Arb. a. d. Physiol. Anst. zu Leipzig, X: 69-80, 1875.

Measurement of capillary pressure (in the human skin).

Opened at illustrations on p. 70.

JANEWAY, THEODORE CALDWELL (1829-1911).

The Clinical Study of Blood-Pressure.

New York and London, Appleton, 1901.

An early comprehensive account of the physiological, technical and clinical aspects of modern blood pressure measurements.

THE PULSE AND ITS IRREGULARITIES.

FLOYER, (SIR) JOHN (1649-1734).

The Physician's Pulse-Watch.

London, Smith & Walford, 1707-1710. 2 v.

The first attempt to revive an exact timing of the pulse after Galileo and Sanctorius (pulsilogium).

PARRY, CALER HILLIER (1755-1822).

An Experimental Inquiry into the Nature, Cause and Varieties of the Arterial Pulse . . .

London, Underwood, 1816.

An important original contribution after Floyer's methods had fallen into disuse, and the significance of pulse study had been deprecated.

POTAIN, PIERRE CARL EDOUARD (1825-1900).

Des mouvements et des bruits qui se passent dans les veines jugulaires.

Bull. et Mem. Soc. méd. d. Hôp. de Paris, 2nd series, IV: Mémoires, 3-27, 1867.

Venous pulse, and murmurs in the jugular vein.

MACKENZIE, (SIR) JAMES (1853-1925).

The Study of the Pulse.

Edinburgh & London, Pentland, 1902.

Use of the clinical polygraph. Opened at figures on p. 13.

WENCKEBACH, KARL FRIEDRICH (1864-).

Die unregelmässige Herztätigkeit und ihre klinische Bedeutung.

Leipzig & Berlin, Engelmann, 1914.

Classical studies in cardiac irregularities. Opened at figures between p. 82-83. (Taf. I).

TRAUBE, LUDWIG (1818-1876).

Ein Fall von Pulsus bigeminus nebst Bemerkungen über die Leberschwellungen bei Klappenfehlern und über acute Leberatrophie.

Ges. Beitr. z. Path. u. Physiol., III: 47-64, 1878.

Earliest description of cases with pulsus bigeminus. Figure on p. 49 shows radial curve in a case of pulsus alternans (first mention) which Traube considers a variation of pulsus bigeminus.

- HOFFA, M. () and LUDWIG, CARL FRIEDERICH WILHELM (1816-1895).
 Einige neue Versuche über Herzbewegung.
 Ztschr. f. rat. Med., IX: 107-144, 1850.
 Experimental production of ventricular fibrillation.
 Opened at description on p. 129.
- MACWILLIAM, JOHN ALEXANDER (1857-).
 Cardiac Failure and Sudden Death.
 Brit. M. J., I: 6-8, 1889.
 Ventricular fibrillation suggested as a cause of sudden death.
 Fibrillar Contraction of the Heart.
 J. Physiol., VIII: 296-310, 1887.
 First description of auricular flutter in mammals.
- RITCHIE, WILLIAM THOMAS (1873-).
 Auricular Flutter.
 New York, Hoeber, 1914.
 First clinical recognition of auricular flutter in man. (Proc. Roy. Soc. Edinb., XXV: 1085, 1905). Opened at illustrations on p. 42 and opposite.
- CUSHNY, ARTHUR ROBERTSON (1866-) and EDMUNDS, CHARLES WALLIS (1873-).
 Paroxysmal Irregularity of the Heart and Auricular Fibrillation.
 Studies in Pathology, Aberdeen University Series, No. 21, 95-110, 1906.
 First recognition in man of auricular fibrillation, ascribed by the authors to vagal inhibition.
- ROTHBERGER, CHARLES JULIUS () and WINTERBERG, HEINRICH ().
 Vorhofflimmern und Arrhythmia perpetua.
 Wien. klin. Wchnschr., XXII: 839-844, 1909.
 First proof by means of the electrocardiograph that the completely irregular pulse was due to fibrillation of the auricle. Opened to show curves on p. 841.
- LEWIS, (SIR) THOMAS (1881-).
 Auricular Fibrillation and its Relationship to Clinical Irregularity of the Heart.
 Heart, I: 306-372, 1909-1910.
 Independent electrocardiographic demonstration that the completely irregular pulse was due to auricular fibrillation. (See Rothberger and Winterberg.) Opened to show figure on p. 355.

ELECTROCARDIOGRAPH

- KOELLIKER, RUDOLPH ALBERT (1817-1905) and MÜLLER, HEINRICH.
 Nachweis der negativen Schwankung des Muskelstroms am natürlich sich contrahirenden Muskel.
 Verhandl. d. Phys.-Med. Gesellsch. zu Würzburg, VI: 528-533, 1856.
 Action currents due to cardiac contraction produce galvanic reaction in sciatic nerve preparation. (See p. 533.)

SANDERSON, (SIR) JOHN SCOTT BURDON (1828-1905) and PAGE, F. J. M.
On the Time-relations of the Excitatory Process in the Ventricle of the Heart of the Frog.

J. Physiol., II: 384-435, 1879-1880.

Investigation with the capillary electrometer of the electric currents produced by cardiac contraction, previously recognized by Matteucci (1843) and by Kölliker and Müller (1856). Opened to show illustration opposite p. 435.

EINTHOVEN, WILLEM (1860-1927).

Die galvanometrische Registrirung des menschlichen Elektrokardiogramms, zugleich eine Beurtheilung der Anwendung des Capillar-Elektrometers in der Physiologie.

Arch. f. ges. Physiol., XCIX: 472-480, 1903.

First description of the string galvanometer for registration of the human electrocardiogram. Opened at p. 472-473.

WALLER, AUGUSTUS DESIRÉ (1856-1922).

The Electrical Action of the Human Heart.

London, University of London Press, 1922.

In the *Phil. Tr.*, 1889, London, CLXXX B: 169-194, 1890, Waller demonstrated the possibility of obtaining curves of the action currents of cardiac contraction without opening the chest, by photographing the mercury meniscus of the capillary electrometer, after leading off from the extremities.

EXPERIMENTAL AND CLINICAL HEART BLOCK.

STANNIUS, HERMANN (1808-1883).

Versuche am Froschherzen.

Arch. f. Anat., Physiol. u. wissenschaft. Med., 85-92, 1852.

Complete heart block, first produced in frog by "Stannius ligature" between auricle and ventricle (see p. 87, paragraph 9). Physiologic heart block had already been noted by Harvey (*De Motu Cordis*, Chapter iv).

GASKELL, WALTER HOLBROOK (1847-1914).

On the Innervation of the Heart, with Especial Reference to the Heart of the Tortoise.

J. Physiol., IV: 43-127, 1883.

Physiologic demonstration of the muscular continuity between the auricle and ventricle in reptiles. The Gaskell clamp. Opened to show p. 57.

CHEYNE, JOHN (1777-1836).

A Case of Apoplexy in which the Fleshy Part of the Heart was Converted into Fat.

Dublin Hosp. Rep., II: 216-223, 1818.

Association of the type of breathing now known as "Cheyne-Stokes" with fatty degeneration of the heart. Opened to show p. 22. (See last paragraph).

ADAMS, ROBERT (1791-1875).

Cases of Diseases of the Heart, accompanied with Pathological Observations.

Dublin Hosp. Rep., IV: 353-453, 1827.

Description of two cases (See p. 390 and 396) of convulsions in heart disease, one associated with irregular breathing and slow pulse. Ascribed to fatty degeneration of the heart. Later termed by Huchard, "Maladie de Stokes-Adams."

STOKES, WILLIAM (1804-1878).

Observations on Some Cases of Permanently Slow Pulse.

Dublin J. M. Sc., II: 73-85, 1846.

Cases of Stokes-Adams disease including also a description (p. 83) of what is now termed Cheyne-Stokes respiration.

EPPINGER, HANS (), and ROTHBERGER, J. ().

Ueber die Folgen der Durchschneidung der Tawaraschen Schenkel des Reizleitungssystems.

Ztschr. f. klin. Med., LXX: 1-20, 1910.

Experimental production of bundle branch block. Opened to show illustrations p. 6-7.

PATHOLOGY.

BONET, THEOPHILE (1620-1689).

Sepulchretum sive Anatomia Practica ex Cadaveribus Morbo Denatis.

Geneva, L. Chouët, 1679. 2 v.

First edition. Early observations on palpitation and cardiac pain associated with a variety of pathologic findings such as aortic aneurysm (page 496 at which volume I was opened) and numerous other thoracic affections.

LANCISI, GIOVANNI MARIA (1654-1720).

De Subitaneis Mortibus.

Venice, A. Poleti, 1708.

Description of aneurysm as a cause of sudden death. Opened at p. 116-117.

De Motu Cordis et Aneurysmatibus.

Leyden, Bonk & Steenman, 1740.

Detailed description of aneurysm of the heart with thinning of the walls (=dilatation) and, distinguished from this, aneurysm with thickening (=eccentric hypertrophy). Associated swelling of the jugular veins with dilatation of the right ventricle.

MORGAGNI, GIOVANNI BATTISTA (1682-1771).

De Sedibus et Causis Morborum per Anatomen Indagatis.

Venice, Remondiniana, 1761. 2 v. in 1.

Contains a full description of valvular and muscular lesions of the heart. Morgagni attributed cyanosis to venous stasis; recognized and distinguished anatomically cardiac hypertrophy and dilatation; and realized the luetic origin of aortic aneurysm. First described case of

angina pectoris with dilated and calcified aorta, as well as a case of rupture of the heart. Opened at p. 70, paragraph 7, describing the first case reported of what is now known as Stokes-Adams disease.

BAILLIE, MATTHEW (1760-1823).

The Works of . . .

London, Longman Hurst . . . 1825. 2 v.

Vol. II, The Morbid Anatomy of Some of the Most Important Parts of the Human Body. Note p. 27 for ossification of the coronary arteries, p. 31 for excrescences on the heart valves and for rupture of the heart.

VIEUSSENS, RAYMOND (1641-1715).

Novum Vasorum Corporis Humani Systema.

Amsterdam, Marret, 1705.

First Edition. Early contributions to heart disease. Clinical and pathological descriptions of mitral stenosis, aortic stenosis and aortic insufficiency, with remarkable description of the pulse in the latter disease.

PHYSICAL DIAGNOSIS.

AUENBRUGGER, LEOPOLD (1722-1809).

Inventum Novum ex Percussione Thoracis Humani . . .

Vicenna, Trattner, 1761.

First edition. First introduction of immediate percussion. Neglected until rescued from oblivion by Corvisart's translation, 1808, just before the death of Auenbrugger.

This volume was kindly lent to the Academy for the exhibit by Dr. E. Mosehcowitz.

LAENNEC, RÉNÉ-THÉOPHILE-HYACINTHE (1781-1826).

De l'auscultation médiate . . .

Paris, Brosson & Chaudé, 1819. 2 v.

First edition. Description of the stethoscope and mediate auscultation. Unlike the discovery of percussion, interest in auscultation followed rapidly and was widespread, so that though Laennec died at 45 of phthisis, he saw his discoveries accepted everywhere.

THERAPY.

WITHERING, WILLIAM (1741-1799).

An Account of the Foxglove and Some of its Medical Uses.

Birmingham, Robinson, 1785.

Use of digitalis for certain forms of dropsy. 1785. A colored plate of the foxglove is shown.

CLINICAL HEART DISEASE.

DE SENAC, JEAN BAPTISTE (1693-1770).

Traité de la structure du coeur, de son action, et de ses maladies.

Paris, Barbou, 1777. 2 v.

First edition, 1749. First textbook on the heart alone. Contains a comprehensive account of cardiac diseases. Called an "opus magni sudoris" because of a lifetime devoted to its study. Most important is his emphasis on the role of inflammation in heart disease. Beautiful illustrations at conclusion of volume I were exhibited.

This copy was kindly lent for the exhibit by Dr. Emanuel Libman of New York, and both volumes of the work have since been presented by him to the New York Academy of Medicine.

CORVISART, JEAN NICOLAS (1755-1821).

Essai sur les maladies et les lésions organiques du coeur et des gros vaisseaux.

Paris, Migncret, 1806.

First edition. Laid great stress on the frequency of heart disease. Corvisart was the first to refer to thrills. By translating Auenbrugger's work on percussion, he saved it from oblivion. Emphasized importance of the myocardium, and was one of the first to describe mitral stenosis.

MYOCARDIAL DISEASE.

FRANK, JOANNIS PETRUS (1745-1821).

De Curandis Hominum Morbis . . .

Vienna, A. Doll, 1810. 7 v.

Volume II opened to show p. 114. Use of the term "carditis" for inflammatory disease of the heart. First used by Aurclianus (see de Senac).

SOBERNHEIM, JOSEPH FRIEDRICH (1804-1846).

Akute idiopathische Herzentzündung. In his: Praktische Diagnostik der innern Krankheiten, p. 118-120.

Berlin, Hirschwald, 1837.

First use of the term "myocarditis."

LEYDEN, ERNST v. (1832-1910).

Ueber Fettherz.

Ztschr. f. klin. Med., V: 1-25, 1882.

ROY, JOHN GEORGE (), and ADAMI, J. G. ().

Remarks on Failure of the Heart from Overstrain.

Brit. M. J., II: 1321-1326, 1888.

KREHL, LUDOLF v. (1861-).

Die Erkrankungen des Herzmuskels und die nervösen Herzkrankheiten.

Vienna & Leipzig, Hölder, 1913.

ALBRECHT, EHRENFRIED (1864-).

Der Herzmuskel und seine Bedeutung für Physiologie, Pathologie und Klinik des Herzens.

Berlin, Springer, 1903.

ANGINA PECTORIS AND CORONARY ARTERY DISEASE.

HEBERDEN, WILLIAM (1710-1801).

Some Account of a Disorder of the Breast.

Med. Tr. Roy. Coll. Phys., 2. ed., London, II: 59-67, 1786.

First description, 1768, of angina pectoris based on the observation of 20 cases. Heberden originated the term.

PARRY, CALER HILLIER (1755-1822).

An Inquiry into the Symptoms and Causes of the Syncope Anginosa Commonly Called Angina Pectoris.

London, Cadell & Davies, 1799.

Concluded there was an important connection between ossification or obstruction of the coronary arteries and angina pectoris. Credited Jenner with discovery of this. Opened at p. 110.

BURNS, ALLAN (1781-1813).

Observations on Some of the Most Frequent and Important Diseases of the Heart . . .

Edinburgh, Bryce, 1809.

First English treatise on diseases of the heart. The first formal textbook was that of Hope, 1839. Burns first ascribed the causation of pain in "angina pectoris" to anemia of the heart muscle as a result of coronary obstruction (p. 138).

NOTHLAGEL, CARL WILHELM HERMANN (1841-1905).

Angina Pectoris Vasomotoria.

Deutsches Arch. f. klin. Med., III: 309-322, 1867.

BRUNTON, (SIR) THOMAS LAUDER (1844-1916).

On the Use of Nitrite of Amyl in Angina Pectoris.

Lancet, II: 97-98, 1867.

HAMMER, ADAM (1818-1878).

Ein Fall von thrombotischem Verschlusse einer der Kranzarterien des Herzens.

Wien. med. Wchnschr., XXVIII: 97-102, 1878.

First case of coronary thrombosis with correct diagnosis ante mortem.

LEYDON, ERNST V. (1832-1910).

Ueber die Sclerose der Coronar-Arterien und die davon abhängigen Krankheitszustände.

Ztschr. f. klin. Med., VII: 459-486, 539-580, 1884.

Discussion of cases of acute and chronic coronary occlusion.

OBRASTZOW, W. P. and STRASCHESKO, N. D.

Zur Kenntnis der Thrombose der Koronararterien des Herzens.

Ztschr. f. klin. Med., LXXI: 116-132, 1910.

First thorough description of coronary thrombosis including 5 cases, 2 of which had been diagnosed during life. Prior to that, Hammer, 1878, had correctly made such a diagnosis ante mortem.

HERRICK, JAMES BRYAN (1861-).

Clinical Features of Sudden Obstruction of the Coronary Arteries.

Reprinted from J. A. M. A., LIX: 2015-2020, 1912.

CHIRAC, PIERRE (1650-1732). Quoted by Dimitri Pletnew in:

Störungen der Synergie beider Herzkammern.

Ergebn. d. inn. Med. u. Kinderh., III: 429-446, 1909.

Quotation is on p. 434. Pletnew states that Chirac was the first to attempt ligation of the coronary arteries, in the latter part of the 17th century.

SMITH, FRED M.

The Ligation of Coronary Arteries with Electrocardiographic Study.

Arch. Int. Med., XXII: 8-27, 1918.

PARDEE, HAROLD ENSIGN BENNETT (1886).

An Electrocardiographic Sign of Coronary Artery Obstruction.

Reprinted from Arch. Int. Med., XXVI: 244-257, 1920.

OPPENHEIMER, BERNARD SUTRO (1876-) and ROTHSCCHILD, MARCUS ADOLPHUS (1887-).

Abnormalities in the QRS Group of the Electrocardiogram associated with Myocardial Involvement.

Reprinted from Proc. Soc. Exper. Biol. & Med., XIV: 57-59, 1916-17.

LIBMAN, EMANUEL (1872-) and SACKS, BENJAMIN (1896-).

A Case Illustrating the Leucocytosis of Progressive Myocardial Necrosis following Coronary Artery Thrombosis.

Reprinted from Am. Heart J., II: 321-326, 1927.

ALLBUTT, (SIR) THOMAS CLIFFORD (1836-1925).

Diseases of the Arteries Including Angina Pectoris.

London, Macmillan, 1915.

Note Vol. II, p. 245-248, for tobacco angina, and Vol. II, p. 415-416 and 449 for cause of pain in angina pectoris.

GALLAVARDIN, LOUIS (1875-).

Les angines de poitrine.

Paris, Masson, 1925.

DANIÉLOPOLU, D.

L'Angine de poitrine et l'angine abdominale.

Paris, Masson, 1927.

Note surgical treatment.

LEVINE, SAMUEL ALBERT (1891-).

Coronary Thrombosis: its Various Clinical Features.

Medicine Monographs, XVI. Baltimore, Williams & Wilkins, 1929.

CONGENITAL HEART DISEASE.

PEACOCK, THOMAS BEVILL (1812-1882).

On Malformations . . . of the Human Heart with Original Cases.

London, Churchill, 1858.

Congenital cardiac malformations had first been observed by de Senac [e. g. absence of interventricular septum (1749)] and Morgagni [pulmonary stenosis (1761)].

ROKITANSKY, CARL (FR.) VON (1804-1878).

Die Defecte der Scheidewände des Herzens.

Vienna, Braumüller, 1875.

Description of septal defects in congenital heart disease which he believed were due to fetal endocarditis. Beautiful illustrations. Opened at figures on p. 138-139.

ABBOTT, MAUDE ELIZABETH SEYMOUR (1869-).

Congenital Cardiac Disease. In: Osler's Modern Medicine.

Philadelphia, Lea & Febiger, 1927. Vol. IV, p. 612-612.

Most comprehensive description of our present knowledge of congenital heart disease.

ENDOCARDITIS AND VALVULAR DISEASE.

WELLS, WILLIAM CHARLES (1757-1817).

On Rheumatism of the Heart.

Tr. Soc. Improve. M. & Chir. Knowl., London, III: 373-424, 1812.

Description of 14 cases of rheumatism of the heart, for recognition of which credit is given to David Pitcairn (1789).

BOUILLAUD, JEAN BAPTISTE (1796-1881).

New Researches on Acute Articular Rheumatism in General; and Especially on the Law of Coincidence of Pericarditis and Endocarditis with this Disease. (Translated from the French ed. of 1836 by J. Kitchen).

Philadelphia, Haswell, Barrington & Haswell, 1837.

The rheumatic etiology of certain forms of cardiac disease first recognized by David Pitcairn (1749-1809) and later by others (Jenner, Corvisart, Hope) was definitely demonstrated by clinico-pathologic correlation by Bouillaud, who also recognized the disease, and originated the term, "acute endocarditis." Endocarditis had been previously described by Corvisart, 1806, and Andral, 1829.

HODGKIN, THOMAS (1798-1866).

On Retroversion of the Valves of the Aorta.

London M. Gaz., III: 433-443, 1829.

Concise pathologic and clinical description of cases with aortic insufficiency. Opened at descriptions on p. 440-441.

CORRIGAN, (SIR) DOMINIC JOHN (1802-1880).

On Permanent Patency of the Mouth of the Aorta, or Inadequacy of the Aortic Valves.

Edinburgh M. & S. J., XXXVII: 225-245, 1832.

Complete description of aortic insufficiency including the character of the pulse which bears the author's name. The valve lesion had been described earlier by William Cooper (1703) and the disease picture, in-

cluding the character of the pulse, by Vieussens (1715). Opened at figures opposite p. 225 to illustrate the character of the lesion which Hodgkin so aptly termed retroversion of the aortic valves.

KIRKES, WILLIAM SENHOUSE (1823-1864).

On Some of the Principal Effects Resulting from the Detachment of Fibrinous Deposits from the Interior of the Heart, and Their Mixture with the Circulating Blood.

Med.-Chir. Tr., London, XXXV: 281-324, 1852.

First description of bacterial endocarditis with emboli from valvular vegetations.

WILKS, (SIR) SAMUEL (1824-1911).

Capillary Embolism or Arterial Pyemia.

Guy's Hosp. Rep., 3rd series, XV: 29-35, 1870.

Emphasis on the frequency of arterial pyemia in association with chronic heart disease. Opened at p. 35.

HEIBERG, HJALMAR (1837-1897).

Ein Fall von Endocarditis ulcerosa puerperalis mit Pilzbildungen im Herzen (Mycosis Endocardii).

Virchow's Arch. f. path. Anat., LVI: 407-424, 1872.

OSLER, (SIR) WILLIAM (1849-1919).

The Gulstonian Lectures on Malignant Endocarditis.

London, 1885. Delivered at the Royal College of Physicians.

First graphic clinical and pathologic picture of bacterial endocarditis based on over 200 cases.

HORDER, (SIR) THOMAS JEEVES (1871-).

Infective Endocarditis with an Analysis of 150 Cases and with Special Reference to the Chronic Form of the Disease.

Quart. J. Med., II: 289-324, 1908-1909.

LIBMAN, EMANUEL (1872-) and CELLER, H. L. ().

The Etiology of Subacute Infective Endocarditis.

Am. J. M. Sc., CXL: 516-527, 1910.

LIBMAN, EMANUEL (1872-).

A Study of the Endocardial Lesions of Subacute Bacterial Endocarditis.

Reprinted from Am. J. M. Sc., CXLIV: 313-327, 1912.

Clinical and pathologic picture of subacute bacterial endocarditis in the bacteria-free (healing and healed) stage.

GERHARDT, DIETRICH (1866-1921).

Die Endokarditis.

Vienna & Leipzig, Hölder, 1914.

BAEHR, GEORGE (1887-).

Glomerular Lesions of Subacute Bacterial Endocarditis.

Am. J. M. Sc., CXLIV: 327-329, 1912.

LIBMAN, EMANUEL (1872-)

Characterization of Various Forms of Endocarditis.

J. A. M. A., LXXX: 813-818, 1923.

DISEASES OF VESSELS—ANEURYSM, THROMBOSIS, EMBOLISM.

HOMIE, (SIR) EVERARD (1763-1832).

An Account of Mr. Hunter's Method of Performing the Operation for the Cure of the Popliteal Aneurism.

Tr. Soc. Improve. M. & Chir. Knowl., London, I: 138-181, 1793.

Additional Cases to illustrate Mr. Hunter's Method of Performing the Operation for the Cure of the Popliteal Aneurism.

Tr. Soc. Improve. M. & Chir. Knowl., London, II: 235-256, 1800.

HODGSON, JOSEPH (1788-1869).

A Treatise on the Diseases of Arteries and Veins, Containing the Pathology and Treatment of Aneurisms and Wounded Arteries.

London, Underwood, 1815.

LOBSTEIN, JEAN-GEORGES-CHÉRÉTIEN-FRÉDÉRIC-MARTIN (1777-1835).

Von der Verdickung der Arterien; oder der Arteriosklerose. In his: Lehrbuch der pathologischen Anatomie (Translated from the French edition of 1829-1833 by Neurohr), II: Chapter vi, 472-474.

Stuttgart, Fr. Brodhag, 1831-1835. 2 v.

First use of the term arteriosclerosis.

VIRCHOW, RUDOLF LUDWIG KARL (1821-1902).

Ueber die akute Entzündung der Arterien.

Virchow's Arch. f. path. Anat., I: 272-404, 1847.

Virchow firmly established the existence of acute arteritis (acute periarteritis and mesaortitis).

KUSSMAUL, ADOLF (1822-1902) and MATER, RUDOLF (1824-1888).

Ueber eine bisher nicht beschriebene eigenthümliche Arterienerkrankung (Periarteritis nodosa), die mit Morbus Brightii und rapid fortschreiten der allgemeiner Muskellähmung einhergeht.

Deutsches Arch. f. klin. Med., I: 484-518, 1865-1866.

First description of periarteritis nodosa associated with Bright's disease.

FELTZ, VICTOR TIMOTHÉE (1835-1893).

Traité clinique et expérimental des embolies capillaires.

Paris, Baillière, 1870.

GULL, (SIR) WILLIAM WITHEY (1816-1899) and SUTTON, HENRY GOWEN (1837?-1891).

On the Pathology of the Morbid State Commonly called Chronic Bright's Disease with Contracted Kidney ("Arterio-capillary Fibrosis").

Med.-Chir. Tr., London, LV: 273-326, 1872.

EPPINGER, HANS (1846-1916).

Pathogenesis (Histogenesis und Aetiologie) der Aneurysmen einschliesslich des Aneurysma Equi verminosum.

Arch. f. klin. Chir., XXXV: 1887.

RAYNAUD, A. G. MAURICE (1834-1881).

On Local Asphyxia and Symmetrical Gangrene of the Extremities.
(Translated from the French ed. of 1862 by Thomas Barlow.)

Selected Monographs of the New Sydenham Soc., CXXI: 1-199,
1888.

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A SELECTED LIST OF NEW PERIODICALS ADDED IN 1931

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PROCEEDINGS OF ACADEMY MEETINGS

JANUARY, 1932

STATED MEETINGS

ANNUAL MEETING

Thursday Evening, January 7, at 8:30 o'clock

ORDER

- I. EXECUTIVE SESSION
 - Reading of the Minutes
 - Election of Fellows
- II. PRESENTATION OF ANNUAL REPORTS
 - The Council, John A. Hartwell
 - The Trustees, Eugene H. Pool
 - The Treasurer, Seth M. Milliken
 - Committees: (Read by title)
 - Admission, Alexis V. Moschcowitz
 - Library, Eugene F. DuBois
 - Public Health Relations, James Alexander Miller
 - Medical Education, Nellis B. Foster
 - Sections, Lewis A. Conner
 - Professional Standards, Samuel W. Lambert
 - Medical Jurisprudence, Israel Strauss
- III. Review of Academy activities of the past eight years and plans for the future, Linsly R. Williams, Director

Thursday Evening, January 21, at 8:30 o'clock

THE FOURTH HARVEY LECTURE

"INVESTIGATIONS ON THE UNDERLYING CAUSES OF DEAFNESS"

S. J. CROWE

Baltimore

This lecture takes the place of the second Stated Meeting of the Academy for January.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, January 5, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Cases from the New York Post-Graduate Medical School and Hospital
 - b. Miscellaneous cases
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF NEUROLOGY AND PSYCHIATRY
Joint Meeting with the
NEW YORK NEUROLOGICAL SOCIETY
Tuesday Evening, January 5, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
Basophilic adenomas and their clinical syndrome, Harvey Cushing,
Professor of Surgery, Harvard Medical School

SECTION OF SURGERY
Friday Evening, January 8, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. 1. A case of giant celled tumor of left upper jaw. Excision of tumor
 2. A case of carcinoma of right upper jaw. Resection of maxilla
 3. A case of sarcoma of floor of the mouth involving left lower jaw
 - a. Resection of tumor with a portion of mandible
 - b. Restoration of continuity of mandible with rib graft,
William F. MacFee
 - b. Two cases of compound fracture, both bones of legs; immediate debridement, suture and cast, Philip C. Potter
 - c. 1. A case of esophageal diverticulum; two-stage operation
 2. A case of recurrent pneumococcus peritonitis
 3. A case of congenital tracheo-esophageal fistula; x-rays and specimens, John V. Bolrer
 - d. Diabetic arteriosclerotic gangrene of foot:
 1. Modified guillotine amputation lower third of leg. Patient aged 70
 2. True guillotine amputation lower third right leg; revision of stump one year later. Modified guillotine amputation lower third left leg. Patient aged 45
 3. Circular flap amputation lower third right leg. Patient aged 70, Beverly C. Smith
- III. PAPER OF THE EVENING
Modified guillotine amputation through lower third of leg for diabetic arteriosclerotic gangrene, Beverly C. Smith

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

SECTION OF HISTORICAL AND CULTURAL MEDICINE
Wednesday Evening, January 13, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. An early undertaking in hospital social service, Marshall C. Pease, Jr.

- b. The dark ages of psychiatric history, Gregory Zilboorg (by invitation)

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF PEDIATRICS

Thursday Evening, January 14, at 8:30 o'clock

ORDER

*Symposium by Members of the Department of Pediatrics,
Johns Hopkins Medical School*

- I. Effect of copper on iron metabolism, Hugh Josephs (by invitation)
Discussion, Randolph West
- II. Prognosis of nephritis and nephrosis in children, Harriet Guild (by invitation), Vivian Tappan (by invitation)
Discussion, John D. Lyttle
- III. Some aspects of mineral metabolism in parathyroidectomized animals,
David Shelling (by invitation)
Discussion, Edwards A. Park (by invitation)
- IV. Rocky mountain spotted fever in children, Paul G. Shipley (by invitation)
Discussion, Thomas M. Rivers
- V. Studies of fat metabolism in infants, H. C. Tidwell (by invitation),
C. M. Kirk (by invitation), L. E. Holt, Jr. (by invitation)
Discussion, Warren Sperry (by invitation)

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, January 15, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
Brain injuries at birth: their classification and subsequent treatment.
Moving pictures, Winthrop M. Phelps, New Haven (by invitation)
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY

Monday Evening, January 18, at 8:00 o'clock

From the Services of the N. Y. Post-Graduate & Knapp Memorial Hospitals

ORDER

- I. READING OF THE MINUTES
- II. EXECUTIVE SESSION
- III. REPORT OF CASES
 1. a. Hole in the macula
b. True follicles in ciliary body
c. Posterior ciliary veins
Lantern slides, Louise Meeker (by invitation). Time 10 minutes
 2. Lantern slide demonstration of muscle cases, Rudolf Aebli (by invitation). Time 10 minutes
Discussion, J. W. White

3. a. Demonstration of a method of studying factors influencing the swelling of the vitreous
- b. Comparative studies of the chemical composition of the blood and cerebrospinal fluid in primary glaucoma, Martin Cohen. L. Halpern (by invitation), John A. Killian (by invitation). Time 10 minutes

IV. PAPER OF THE EVENING

Relation of human constitution to disease. George Draper

REPORT OF CASES

4. Demonstration of brain with a pituitary tumor, John A. Billingsley (by invitation). Time 5 minutes
5. Treatment of toxic amblyopia with vasodilators. W. F. Duggan (by invitation). Time 5 minutes
6. Cases of retinal detachment treated by the Gonin method, Franklin Bracken (by invitation)
7. Radium injury to the conjunctiva, Arnold Knapp. Time 10 minutes
8. Demonstration of a method of registering ocular pulsations, Benjamin Friedman (by invitation). Time 5 minutes
9. a. A case of angioid streaks of retina (demonstration at the Gullstrand ophthalmoscope)
- b. A case of granuloma of cornea with unusual features, David A. Newman. Time 5 minutes
10. a. A case of Paget's Disease
- b. A case of glaucoma associated with naevus of face and globe (slit lamp demonstration), H. H. Tyson. Time 10 minutes
11. Slit lamp demonstration of a case of lentiglobus posterior, Joseph Ziporkes (by invitation)
12. A case of ankylo blepharon (familial, bilateral) with operative results, A. Fine (by invitation)
13. Radium therapy in the N. Y. Eye & Ear Infirmary, G. A. Robinson. Time 10 minutes

To facilitate the examination of the patients the demonstration began at 8 P. M.

SECTION OF MEDICINE

Tuesday Evening, January 19, at 8:30 o'clock

ORDER

PAPERS OF THE EVENING

- I. Bronchial asthma, Maximilian A. Ramirez
- II. Infective asthma, Robert A. Cooke
- III. Infective asthma, R. Clark Grove (by invitation)
- IV. GENERAL DISCUSSION

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, January 20, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Endocrine factors involved in the development of the genital system

Lantern slide illustrations, William Engelbach (by invitation)

- b. Impotence, its diagnosis and treatment, Max Huhner

Discussion opened by Irving Pardee, James I. Farrell (by invitation)

III. GENERAL DISCUSSION

SECTION OF OTO-LARYNGOLOGY

Wednesday Evening, January 20, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

III. PAPERS OF THE EVENING

Evaluation of roentgenology in oto-laryngology

- a. Anatomy of the sinuses and mastoids, Mr. E. Burchell (by invitation)

- b. Teeth, Solomon Fineman

- c. Sinuses, Frederick M. Law

- d. Mastoid, George S. Dixon

- e. Larynx, Ross Golden

- f. Bronchi, Leon T. LeWald

- g. Oesophagus, A. Judson Quimby

- h. Chest, Leopold Jaches

IV. DISCUSSION

Harmon Smith, Duncan Macpherson, Mervin C. Myerson, Bissell B. Palmer, Luther B. MacKenzie

V. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, January 26, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

Program presented by the Staff of Mt. Sinai Hospital

- a. Post menopausal bleeding, Samuel H. Geist, discussion, Gerard L. Moench

- b. The question of myomectomy in relation to fertility with some observations on technic, Isidor C. Rubin, discussion, Hiram N. Vineberg, Samuel J. Scadron

- c. Induction of therapeutic abortion by means of the Roentgen rays, William Harris (by invitation), discussion, Hiram N. Vineberg

- d. Ventral hernia following ventrofixation, Howard E. Lindeman, Max D. Mayer (by invitation)

- e. Ureter stricture as a factor in the diagnosis of pelvic disturbances—2 cases, Isidor Kross, discussion, Gerard L. Moench

f. Kraurosis vulvae and its treatment

Report of 12 cases, Morris A. Goldberg, discussion, Theodore Neustaetter (by invitation)

g. Treatment of dyspareunia, Max D. Mayer (by invitation), Hiram N. Vinberg

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

AFFILIATED SOCIETIES

New York Meeting
of the

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
Under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday Evening, January 20, at 8:15 o'clock

- I. A new method for staining bacterial capsules, J. W. Churchman and N. V. Eneclianoff
- II. Presence of capsules on "non-capsulated" microorganisms, J. W. Churchman and N. V. Eneclianoff
- III. Studies of yellow fever virus in tissue culture, E. Innagen and M. Theiler (introduced by J. H. Bauer)
- IV. Lethal action in the short-tailed mutation in the house mouse, Paul Chesley (introduced by L. C. Dunn)
- V. Specific and non-specific cell polysaccharides of the human type tubercle bacillus, M. Heidelberger and A. E. O. Menzel
- VI. Protein fractions of the timothy grass bacillus, M. Heidelberger and A. E. O. Menzel
- VII. Influence of ortho-substitution on the conjugation of benzoic acid, A. J. Quick
- VIII. General hyperthermia with heat localization by radiotherapy, W. Bierman and M. Schwarzschild (introduced by B. N. Berg)

NEW YORK PATHOLOGICAL SOCIETY

In Affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, January 28, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. Red cell regeneration following copperin therapy, Burr R. Whiteher
- b. Renal blastoma with cranial metastasis, J. S. Grewal (by invitation)
- c. The tonsil in relation to branchio-genetic cysts, Louise Mecker
- d. The influence of blood and of exudate upon the action of bacteriophage against the colon bacillus, Martha Applebaum (by invitation), Ward J. MacNeal

- e. Studies on commercial bacteriophage products, Martha Straub (by invitation), Martha Applebaum (by invitation)
- f. Bacteriophage as a therapeutic agent in staphylococcus bacteremia, Ward J. MacNeal, Frances C. Frisbee (by invitation)

II. EXECUTIVE SESSION

Election of Officers

THE NEW YORK ROENTGEN SOCIETY
in affiliation with

THE NEW YORK ACADEMY OF MEDICINE
The New York Roentgen Society
invited

The New England Roentgen Ray Society,
The Philadelphia Roentgen Ray Society
and

The Roentgenologists of Baltimore and Washington
to attend a

Roentgenological Conference

Friday, January 29

and

Saturday, January 30

Friday morning conference at The Presbyterian Hospital

Friday afternoon conference at The Mt. Sinai Hospital

Saturday morning conference at The Memorial Hospital

Saturday afternoon conference at The New York Academy of Medicine

FELLOWS ELECTED FEBRUARY 4, 1932

Simon Anthony Beisler.....	121 East 60 Street
John Woolman Churchman	215 East 72 Street
John Dorsey Craig	12 East 11 Street
Gilman Sterling Currier	Bernardsville, N. J.
John Staige Davis.....	791 Park Avenue
William Robert Delzell.....	945 Lexington Avenue
Alan Gregg	61 Broadway
Edward Bellamy Gresser.....	39 Fifth Avenue
Sophia J. Kleegman	59 East 54 Street
William Andrew Krieger	Poughkeepsie, N. Y.
Henry Minsky	1 West 86 Street
Samuel Torrey Orton	66 East 79 Street
Louis Apgar Pyle	Jersey City
Edward J. Riley	102 East 68 Street
Irving R. Roth	45 East 82 Street
Seth Selig	18 West 82 Street
Lawrence Wells Sloan	620 West 168 Street
Herbert Edward Stein	41 West 75 Street

Carl TenBroeck	Rockefeller Institute, Princeton
Norman Treves	131 East 43 Street
George Barnet Tribble	Washington, D. C.
Arthur Fulton Warren	50 East 63 Street
Irving Sherwood Wright	523 Park Avenue
Frederick A. Wurzbach, Jr.	200 Central Avenue
Asher Yaguda	Newark

AND FOR ASSOCIATE FELLOWSHIP

Walther Friedrich Goebel, Ph.D.	Rockefeller Institute
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DEATHS OF FELLOWS OF THE ACADEMY

GEORGE HENRY FOX, M.D., 1 Mather Street, Binghamton, N. Y.; graduated in medicine from the University of Michigan, Ann Arbor, in 1900; elected a Fellow of The New York Academy of Medicine April 3, 1929; died, December 26, 1931. Dr. Fox was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the American Society for Clinical Pathology, a member of the Academy of Medicine of Binghamton, Dermatologist to City Hospital and Consulting Dermatologist to City Hospital, O.P.D.

HENRY ILLOWAY, M.D., 1113 Madison Avenue, New York City; graduated in medicine from the University of Cincinnati, in 1869; elected a Fellow of the Academy March 15, 1900; died, January 15, 1932. Dr. Illoway was a Fellow of the American Medical Association, a member of the County and State Medical Societies and other professional organizations.

LOUIS LIVINGSTON SEAMAN, M.D., Brouxville, N. Y.; graduated in medicine from Jefferson College, Philadelphia, Pa., in 1876; elected a Fellow of the Academy April 2, 1885; died, January 31, 1932. Dr. Seaman was a Fellow of the American Medical Association, a member of the County and State Medical Societies and many other professional organizations. In 1909 Dr. Seaman delivered the Anniversary Discourse of the Academy, on the subject "Personal Observations of the Sleeping Sickness in Uganda, with Illustrations of a Short Safari to the Source of the Nile."

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VIII

MARCH, 1932

No. 3

REVIEW OF ACADEMY ACTIVITIES*

LINSLEY R. WILLIAMS, Director
New York

The Annual Report of the Council of the Academy of Medicine of 1890 informed the Fellows that the Academy had been installed in its new, handsome, Renaissance building which was of the most modern fireproof construction and sufficient in size for the needs of the Academy for all time. Within twenty years, the books of the Library had completely filled the existing stack and had spread over into various Section rooms and hallways and became a matter of serious concern to the Library Committee. At a meeting of the Library Committee in January 1909, Dr Haven Emerson offered a resolution that the Chairman urge the Council to consider the pressing needs of the library and as rapidly as possible provide additional space for books.

In the spring of 1910, upon the recommendation of the Council, the Academy voted to purchase 15 West 43 Street and 10 West 44 Street and the existing building was mortgaged for \$225,000. In the autumn the two new sites were acquired.

No satisfactory plan having been devised for extending the stack the Trustees later sold 10 West 44 Street. The Council was nearly ready to go ahead, with a plan utilizing No. 15 West 43 when prices materially increased at the outset of the war so the project was postponed.

The project was re-opened in 1921 when the Academy Extension Fund had increased to \$178,672.51. Dr. George

*Delivered at the Annual Meeting of the Academy, January 7, 1932.

David Stewart the President appointed Dr. D. Bryson Delavan Chairman of the Committee on Plan and Scope and Dr. L. Emmett Holt as Chairman of the Committee on Building and Finance.

In April 1921, it was voted that another effort be made to buy a larger plot of ground and to erect a new building. The Council had received considerable encouragement on learning that Mr. Henry S. Pritchett of the Carnegie Corporation had heard of the Academy's project and was very much interested in the need of housing the library in a modern fireproof building.

Dr. Delavan's Committee drew up a plan for the development of the Academy which was presented informally at a meeting called by the President in March 1921 and a number of the Fellows felt that the plans proposed were impractical, hopelessly expensive or a dream. The Committee, however, presented its full report to the Council in June 1921 which was finally adopted but was not published until it appeared in the Academy Bulletin in December 1927 in a review prepared by Dr. Delavan entitled, "Incidents in the Recent History of the New York Academy of Medicine." The report stated, "The time of building is not so important as is the formulation of a general plan, comprehensive, far reaching and adequate. We can well afford to postpone definite action for a short period in view of the importance of a wise decision."

The Committee on Building and Finance gave serious consideration to the question of site which was not a simple problem and no immediate action thereon was taken.

In 1922 the Carnegie Corporation voted a grant of a million dollars for a new Academy building with the restriction that it approve the site and the plans for the building.

Subsequently, the Rockefeller Foundation voted to grant \$1,250,000 in accordance with an agreement which provided that the Academy should carry on ten activities for a period of ten years and that during that time the

Foundation would pay to the Academy the interest on \$1,250,000 and if at the end of that time the Foundation was satisfied that the work was useful it would pay over the principal to the Academy. The condition was also made that the Academy provide a site.

The selection of the site was a very troublesome problem and an agreement was reached only when one of the Vice-Presidents secured a gift of \$50,000 in January 1923 contingent upon the Academy erecting its new building at the then most favored site, the south-east corner of Park Avenue and 60th Street. Dr. Nathan E. Brill objected strongly to the selection of this site on the ground that it was no larger than the 43rd Street site. As a result of his arguments, an additional lot was bought on 60th Street, making the plot 100 x 120. The cost of the land at 60th Street was \$754,000.

A new committee was appointed at a meeting of the Council in January 1923 to solicit funds for the purchase of the site and for new endowment. This committee consisted of Dr. Royal S. Haynes as Chairman, Drs. Niles, Wallace, van Beuren and La Fetra, with power to add to their number. Instructions were given to the Committee that they should raise \$250,000 by May 1st, 1923. Under the active leadership of Dr. Haynes, an extensive drive was maintained, the results of which were highly gratifying; 1313 Fellows gave or pledged \$206,161.64 and the officers and other Fellows also secured donations or pledges from their friends amounting to \$324,922.78, a total of \$531,084.42.

PLANS FOR THE BUILDING

During the winter of 1923, the Building Committee, under the Chairmanship of Dr. Arthur B. Duel, had been at work with the architects, Messrs. York & Sawyer, developing a plan for the new building that would have cost over \$2,300,000.

One of the stipulations in the agreement with the Rocke-

feller Foundation was that a Director of the Academy's activities be appointed and after conversations with the representatives of the Foundations, it was reported at the December 1923 meeting of the Board of Trustees of the Academy that the Rockefeller Foundation had voted sufficient money to inaugurate the work of the Bureau of Clinical Information and to pay the salaries of a Director and Librarian. With this knowledge in hand, the Director was appointed and began his services on January 2, 1924. At this same meeting of the Trustees, it was also reported that the Carnegie Corporation could not make a larger grant for the new building and the new Director was asked to study the plans and the entire project and to consider further what could be done.

The Trustees and Council were convinced at their March meeting that the site at 103rd Street should be purchased as it was known that it could be obtained for \$225,000 and that the 60th Street site could probably be sold for \$1,000,000. The site was so desirable that efforts were made to hold it for the Academy and at a special meeting of the Trustees held on April 16, 1924, it is noted in the minutes that "the Director reported on the general situation and stated that he had arranged to have this property held for the Academy."

As soon as it was learned that the 103rd Street site had been acquired, the architects, York & Sawyer, were instructed to prepare new plans for a less expensive building.

A continued study of the project was made by the Director, acting under the instructions of the Building Committee and in constant conference with the architects who finally produced a set of plans for a building which would cost \$1,550,000. After continued negotiations with Mr. F. P. Keppel of the Carnegie Corporation, the Corporation finally voted the Academy an additional grant of \$550,000 in the spring of 1924. The plans were then completed and construction undertaken in the summer of 1925, and the building was opened on November 16, 1926.

FINANCIAL

The 103rd Street site with the additional lot subsequently purchased cost \$242,000 so that there was a saving of \$512,000 in the cost of the final site and a very fortunate profit of \$246,000 on the 60th Street site, saving the Academy \$758,000.

With the expectation of constructing a new building, the Trustees had discussed from time to time the possible sale of the 43rd Street property as early as 1923, which was finally sold for \$745,000.

The land and building at 43rd Street represented an investment of \$224,000 and the proceeds of the sale of this property added over \$500,000 to the Academy's endowment fund. These very fortunate transactions made it possible for the Academy to undertake its new program in the new building without being harassed by the necessity of raising a very large additional endowment which would have been necessary to carry on the activities at 60th Street. The land and building at 60th Street called for a total expenditure of over three million dollars whereas the land and building at 103rd Street cost \$1,800,000. This reduced the annual fixed charge on land and building by approximately \$60,000 a year.

No formal annual budget was adopted by the Academy prior to 1924 but this was soon provided for, and since that time an annual budget has been voted by the Trustees at their December meeting. The requests for appropriations are made to the Director who reviews them with the head of each department, and a tentative budget is prepared by him and submitted to a Budget Committee of the Trustees, and then considered by it before being submitted to the Trustees for action. The expenditures of the Academy have been from \$150,000 to \$300,000 a year and the expenditure of this sum of money has made it necessary to provide control over expenses by the installation of a satisfactory system of bookkeeping and budgetary control.

It has seemed wise to the Trustees to determine each

year in what way the dues of the Fellows shall be utilized. They recognize the fact that the Fellows of the Academy are interested primarily in the Academy as an institution of their own, and that the Section and Stated Meetings and the Library are essential features which are of primary value and interest to the Fellows. Accordingly the dues of the Fellows, which amount to approximately \$70,000 a year, are appropriated for the maintenance of the building, the Stated and Section meetings, salary of the membership clerk, part of the salary of the Cashier, and the balance to the Library. This proper allocation of the members' dues means that the work of the Committee on Public Health Relations, the Committee on Medical Education and the salaries of the administrative staff are paid from the Rockefeller and other endowments, so that no additional burden falls upon the Fellows.

In 1924, the Academy had a limited membership of 1100 resident Fellows which number was gradually increased to 1700 by 1926. At that time, the Board of Trustees consisted of five elected Trustees, the President, the Secretary and the Treasurer; and the Council included in addition to the Trustees the three Vice-Presidents and the Chairmen of the Committee on Admission and the Committee on Library and the Corresponding Secretary. Although the Public Health Committee had been in existence for a number of years, and its Chairman was a Trustee, the Committee had no authorized representative on the Council nor did the newly created Committee on Medical Education. It seemed wise at that time to have the Academy's charter amended so as to provide a larger number of Trustees and legislation was subsequently enacted which authorized an increase of the number of Trustees up to fifteen and authorized the Academy by its Constitution to specify the actual number. There are now ten Trustees and in addition the President, Secretary and Treasurer ex-officio.

These changes in the charter and changes in the financial matters required many alterations in the Constitution and By-Laws of the Academy. In addition to these two

important changes, there have been several other modifications of considerable interest which provide the following: that dentists may, under certain circumstances, become Associate Fellows of the Academy; that physicians who are giving full time to laboratory, teaching or administrative work may, on account of their small salaries, be accepted as regular Fellows without payment of an admission fee and at reduced annual dues. Another important provision was authorized by the Academy which placed the complete direction of the Academy's activities and the control of its policies in the hands of the Council.

An important function of a committee is the searching of minds and the development of joint opinion. It seems perfectly clear that in this country at least and particularly in our own medical profession, an idea or opinion of one individual on a particular matter when put into effect by him meets with nothing but antagonism and criticism of autocratic method. That same idea or opinion when proposed to a regularly constituted committee, discussed by it, finally adopted and subsequently approved by the governing body and submitted to the membership, receives as a rule very general support. There has been developed in the Academy Fellowship a definite democracy and community of interest in that all new proposals have received careful consideration. One of these proposals, not as yet put into effect, is a new classification of members and will be discussed later.

In 1923, there existed the Council and Trustees, the Committee on Admission, the Committee on Library and the Committee on Public Health with a total membership of less than 40 persons. Since that time, there have been created as standing committees of the Academy, the Committee on Medical Education and the Nominating Committee and in addition, many standing committees of the Council such as the Committees on Professional Standards, on Honorary Fellowship, Academy Medal and numerous other committees appointed for special purposes which are not continuing committees. At the present time, the

various standing committees of the Academy and Council and sub-committees exact service each year of over 300 Fellows of the Academy. The service of these Fellows with the various interrelationships between the committees bring about what is so aptly described in French as a "movement of opinion" which tends to knit the Fellowship of the Academy more closely together at least in ideas, if not bringing them all together in actual contact. It has been noticed also that many Fellows not known to each other previously have by their contact on committees developed into steadfast friends and above all, the increased committee activity has developed into a deepening sense of loyalty and admiration for the organization itself. There is no one thing which exemplifies this to a greater degree than the most hearty and sympathetic spirit shown by many of the Fellows in the recent efforts of the Academy to complete a fund of \$800,000, most of which has been subscribed, however, by private individuals and foundations. The final balance of \$32,000 was subscribed between Thanksgiving and Christmas by Fellows of the Academy and their friends. No expression of appreciation could give greater satisfaction to the Director than this indication of enthusiasm and loyalty at this critical period of the world's history.

LIBRARY

The Committee on Plan and Scope developed a number of ideas for increasing the usefulness of the Library, which were enlarged and modified in the discussions with the Rockefeller Foundation and which were finally put into the agreement. The articles of the agreement specified that the Academy should employ a full time competent Librarian and inaugurate a bibliographic and photostat service, but none of the new Rockefeller funds were to be used for the purchase of journals or books. The Library budget for 1923 amounted to \$28,351.85.

A historical allusion should be made to the fact that prior to the consolidation of the activities of the Academy

under the direction of one individual, the Library, Public Health Committee and the governing body were practically three separate entities. For years, the Trustees insisted that the Library should be maintained on the income from general and special library funds which amounted at that time to about \$11,000. After the war, after many discussions between the Library Committee and the Trustees, the Trustees finally agreed to appropriate for the purposes of the Library a sum of money annually for the payment of the staff, while the income from restricted library funds could be utilized for library maintenance. The funds added by the Rockefeller grants made it possible to pay the salaries of the Librarian, the bibliographers, and photostat operator on that fund but the development of the Library was left to the general funds of the Academy. That the Library has not been neglected by the Trustees is shown from the following expenditures made for the Library during the last few years:

Library Expenditures—Round Figures

	<i>Salaries</i>	<i>Expenses</i>	<i>Total</i>
1926	\$25,900	\$22,800	\$48,700
1927	55,500	23,300	78,800
1928	57,300	31,400	88,700
1929	60,400	34,900	95,300
1930	58,700	37,200	95,900
1931	60,800	39,000	99,800

Bibliographic Department

There had been a number of individuals who regularly worked in the library and who prepared bibliographies and translations for Fellows and others at rates determined by agreement in each instance. In the development of the bibliographic service of the library some of these individuals were taken over by the Academy and additional ones employed. It seemed only proper that the Fellows of the Academy who contributed toward the support of the library should pay a reduced rate for this type of service

and those who were not should pay double that rate. This procedure has been carried out satisfactorily for eight years.

When a bibliography on a particular subject has been prepared, it has been placed on file in the library and is available for reference at any time. If a period of time has elapsed since it was prepared, the amount of labor necessary to bring it up to date is relatively small. The number of these bibliographies now on file in the Academy is 482 and includes such titles as convolutions and fissures of the brain; postgraduate medical education; prevalence of heart disease; hysterectomy; Jews: diseases and anthropology; prevention of nervous and mental disease; preventive medicine of ear, nose and throat; meningococcus bacteremia, etc.

Photostat

It was something of an innovation when the photostat machine was installed in the new building and some Fellows were skeptical as to its being sufficiently used. As time has gone on, its use has been constantly augmented and during this last year there have been several occasions when the operator has had to have assistance to keep up with the work on hand.

Growth of Library

The growth of the library has kept on apace and almost each succeeding year brings a larger increment of books and journals as well as many other important donations. This has been commented on each year in the Annual Reports and it will not be necessary to repeat here because every Fellow reads the Annual Report with great care from cover to cover.

Some notable things have happened to the library, in particular, the purchase of the Streeter Collection of classics and incunabula in 1928 for the sum of \$185,000. This important addition to our Library was made possible by the enthusiasm and hard work of the then

President, Dr. Samuel W. Lambert. This historical collection materially augmented the existing collection of the Academy in this field and although numerically the Academy may have fewer incunabula than the Surgeon General's Library or the Library of the College of Physicians in Philadelphia, the mere presence of this collection has added enormously to the interest of a large number of the Fellows of the Academy in the subject of historical medicine.

ATTENDANCE IN THE LIBRARY

Nov. 25th to Dec. 27th, 1931, inclusive:

Doctors, New York City	2081
Doctors, outside New York City	202
Medical students	451
Non-Medical students	213
Workers in other sciences than medicine.....	301
Law workers	14
Secretaries	146
Others	467
	<hr/>
	3875

MEDICAL EDUCATION

In 1912, a group of physicians in New York City formed themselves into a society for the advancement of clinical study. This society maintained an office in the Academy and sent out a daily bulletin of surgical clinics and also published a booklet of fixed clinics. During the war it published a notice of medical clinics.

After the war in 1919, another group of physicians, most of whom were Fellows of the Academy, became deeply interested in the subject of postgraduate medical instruction and organized themselves under the name of the New York Association for Medical Education. This group secured a grant from the Carnegie Corporation, employed an executive officer, who made a study of the various opportunities available for graduate study in New York City and published a list of the various courses available. The Association also prepared an outline of the requirements for the training of specialists.

Conferences were held with representatives of these two organizations and with the coöperation of the late Dr. Charles N. Dowd who was President of the Society for the Advancement of Clinical Study in New York, and Dr. Wendell C. Phillips, who was Chairman of the New York Association for Medical Education, which resulted in each Association being dissolved and a number of the members of each society were appointed by the President of the Academy as a Committee on Medical Education with Dr. Charles N. Dowd as Chairman.

The unexpended balance of the grant from the Carnegie Corporation was transferred to the Academy and additional funds were secured from the Rockefeller Foundation at the end of the year and the work has been carried on continuously since that time.

There has been a considerable amount of routine activity carried on by the Bureau of Clinical Information which continues the publication of the surgical bulletin, the list of fixed clinics, and renders a still more important service by personally interviewing visiting physicians from all parts of the world as well as physicians of New York City. The visiting physicians are given cards of introduction to various professors and chiefs of staff of the different hospitals and in special cases, personal interviews are arranged so that each visitor may receive the greatest benefit possible from his usually brief stay in the city.

In addition to this, a number of physicians from the city and from various states in the union consult the Bureau for advice as to opportunities for foreign study. A number of the members of the Committee on Education are well informed of these opportunities by personal contact in Europe and many of them have graciously given of their time to advise numbers of these physicians as to the proper course to pursue.

Opportunities for internships and residencies have been compiled by the Bureau and a list of all of those avail-

able is maintained so that inquiries in regard to this type of opportunity may be readily answered.

Two notable contributions toward the progress of medical education have been made by members of the Committee. In 1928, Dr. Ludwig Kast described to the Committee an intensive, brief method of graduate study which was carried out in Berlin which was very largely attended and which appeared to serve a very useful purpose. He suggested to the Committee the possibility of the Academy organizing a series of clinics, lectures and exhibits annually for a period of two weeks. A beginning was made and such a fortnight was held during October 1928. This proved so successful that it has been continued to date and has created a wide interest. It has attracted an increasing number of physicians although largely from the metropolitan area but also from different states of the union. It has served a valuable educational purpose. The fortnight cannot be looked upon as a wholly sound educational procedure, but it does add to the interest of the visiting physicians and in many instances has stimulated them to pursue more actively their laboratory and clinical studies in the field of medicine presented. The organization of the fortnight has required a great deal of time, effort and brains and the Academy owes a great debt to the chairmen of the successive fortnight committees, Drs. Ludwig Kast, Harlow Brooks, and Emanuel Libman and also to Dr. Louis Gross who for three years has so successfully arranged the exhibits.

The organization of a Board of postgraduate studies representing 34 different hospitals in New York City, with Dr. Carl Eggers, Chairman, will bring about ultimately many sweeping changes in opportunities for study in New York City. Dr. Eggers has talked in season and out of season of the necessity of providing residencies with fellowships in various hospitals for training in the various fields of medicine so that there might be some real extension of the present apprentice system of acquiring com-

petency in internal medicine, surgery, and the various specialties.

This idea led also to its corollary, namely, the importance of preparing men for general practice. A large amount of time and thought has been given to the continued training of the physician and the committee has recognized that as soon as the physician is graduated from medical school his graduate study begins. It appears that in many hospitals, even those connected with medical schools, the organization of the residencies and intern staff is made primarily for the benefit of the hospital and the visiting staff and with relatively little regard for the preparation of the intern for either general or special practice.

While these plans and discussions of the Committee on Medical Education have been going forward, some of the Fellows of the Academy have taken an active interest in promoting still further the plans for graduate study under University auspices. Efforts along this line have finally brought about an affiliation of the New York Post-Graduate Medical School with Columbia University and the appointment of a joint board of graduate studies representing the Post-Graduate Medical School and the College of Physicians and Surgeons and the University itself. The plans for graduate study under the auspices of this joint board are in complete accord with the plans laid down by the Committee on Education. It would appear, therefore, that the clinicians interested in graduate study since 1912 have by indirect and useful methods brought about the recognition of graduate medical study as a definite and indispensable part of University organization.

Continued Medical Education

It is evident to all of us that the education of the competent physician is never finished. Although by law the young graduate is entitled to practice medicine as soon as he receives his license, yet we know that he is not fit until

he has had an apprenticeship as an intern. He is then better qualified but still lacks in experience, and he needs further information which can be acquired in journals and textbooks, and if he desires to become a specialist he needs a special type of instruction and training.

It is of primary interest to the Fellows of the Academy that the institution itself should be alive to the vast problem which presents itself in this field of continued education. The Academy of Medicine is not and cannot become a graduate school of medicine but it should become more and more the center of information and the promoter of activities for affording opportunities to physicians for their continued education. This was pointed out very forcibly by our President, Dr. Hartwell, in an address given last year.

PUBLIC HEALTH

The Public Health, Hospitals and Budget Committee was organized in 1911 shortly after a study had been made of the report of Mayor McLellan's Hospital Commission and was primarily for the purpose of studying and suggesting changes in the budgets of the Department of Health and the hospitals of the city which were then under the Bellevue and Allied Hospitals and the Department of Charities.

Prior to the organization of the Committee there had been a Section on Public Health in which a small number of the Fellows of the Academy were intensely interested. The Section on Public Health was then abolished and the Fellows interested in that particular type of work were largely chosen to form the new committee. Several years later, the name of the Committee was changed to the Committee on Public Health and a few years ago to the Committee on Public Health Relations.

It would be impossible to read a list of the subjects considered by this Committee over a very wide field within the limits of the entire evening. Its activities have been

most varied and interesting. In addition to the routine work of studying the administrative methods and budgetary proposals of the city's health and hospital activities, it has made a number of intensive studies which have led to unusual results. A study of child welfare work in the city was made and subsequently published which gave a great stimulus to the operation of the various agencies in the city engaged in this type of activity. An intensive study of hospitals and dispensaries produced two notable results—one, the organization of the Hospital Information Bureau under the United Hospital Fund which was for a time carried on in the offices of the Academy and under the direction of the Public Health Committee; second, the creation of the Dispensary Development Committee which made a five year intensive study of the dispensary situation in New York. After its labors were concluded, it turned over to the New York Tuberculosis and Health Association the organization known as the Association of Out Patient Clinics which endeavors through representatives of each of the dispensaries to see that proper standards of dispensary care are maintained. Another product of the Dispensary Development Committee was the creation of a better record system in a number of the dispensaries and hospitals and the creation of the Cornell pay clinic. The policy adopted by the Council in authorizing the Chairman of the Public Health Committee to appoint on sub-committees of the Public Health Committee any Fellow of the Academy has made it possible for the Committee to secure the advice and counsel of many men of many minds. It is a remarkable fact that the Academy of Medicine of France is the official advisory body of the French Government on matters of hygiene and public health. It is also a matter of personal knowledge that most of the important advice given by the Academy of Medicine of France to the Government is usually tucked carefully away in a pigeon hole and no action taken. On the other hand, our own Public Health Committee has no official standing in the City of New York, but its advice is fre-

quently sought and taken by the Health Department and the Hospital Department of the City.

The Academy has had no permanent legislative committee, but legislative matters are often considered by the Committee on Public Health Relations. One of its earliest legislative efforts was to bring about the consolidation of quarantine stations under the United States Public Health Service and the transfer of the New York State quarantine station to the Federal Government. Dr. Abraham Jacobi, our late revered Fellow, was the prime mover in bringing about this important administrative change.

During the first dozen years of the Committee's life, it was treated more or less as a stepchild by the Academy and its members were forced to seek funds for its support, although the Academy was willing to give it house room. The Academy was not able to appropriate any money for its maintenance until after the Rockefeller agreement went into effect. Much time and successful effort was devoted by Dr. Charles L. Dana and Dr. James Alexander Miller to the development of the work of the Committee and to securing funds. For many years, Mrs. E. H. Harriman has been an interested sponsor of the work and donations made by her annually have made the work of this Committee possible.

It is interesting to note that in the early days of the Committee a large number of the active workers were in their early thirties. Today, it seems hardly possible for anyone to break into the high society of this Committee unless he has attained the youthful age of at least fifty-five.

PUBLICITY

In the early winter of 1925, Dr. Dana placed the suggestion before the Council that the Academy organize a publicity bureau to give information to the press. This somewhat startled some of the sedate members of the Council. They responded nobly, however, and forwarded a rather lame resolution to a Stated Meeting of the Academy, at which meeting the late Dr. Walter B. James

spoke against the resolution and it was very promptly decided in the negative.

Although he did not say so then, the new Director was intensely interested in Dr. Dana's proposal and was extremely eager to have it put into effect, although at that time he was opposed to it, for he recognized that he was not competent to run such a service himself, nor were there funds available then to employ an assistant for that purpose.

It was not until 1929 that the Press Relations Bureau was organized jointly with the County Medical Society for the purpose of maintaining relations with the press. Publicity has served and will continue to serve many useful purposes. It must be evident to any Fellow that he cannot attend all of the meetings held at the Academy nor can he attend even the rarer important meetings which have a highly educational value. As a matter of fact, there have been a number of occasions when a great many more than a thousand physicians have attempted to gain entrance to Hosack Hall. The publication of an abstract of a paper read at the Academy in the morning newspapers is frequently read by interested physicians and also by physicians who subscribe only to the journal of the American Medical Association and one sometimes sees in such a physician's office fifty or sixty of the latest copies piled high on a desk unopened, unhonored and unread.

There is also an advantage in informing the readers of the press that there is an institution, known as the New York Academy of Medicine, and that it maintains a centre from which medical news may be distributed.

The Bureau, however, serves a far more important purpose than this. Under the leadership of Dr. Orrin S. Wightman, a number of dinner conferences have been held for three years with representatives of the press and many differences between the medical profession and the fourth estate have been ironed out. There is now a centre of information to which representatives of the press come almost daily for advice on many items of medical news and

the influence of the Bureau has so grown in the short space of two and a half years that many new "cures" which are about to be heralded upon an unsuspecting public through the medium of the press have been buried in the morgue of the newspaper.

It is also astonishing to see how readily the National Better Business Bureau, the broadcasting companies and the large advertising agencies seek the advice of the Bureau on many matters. The use of the radio for addresses on various medical and public health topics has been gradually brought under control although there is still room for improvement. An enormous amount of advertising copy is submitted by advertising agencies and the press and the Bureau's advice accepted to a very large degree. There has been a very definite change in the advertising policy of a number of our more dignified newspapers for which the Bureau must be given real credit.

As the Bureau represents both the County Medical Society and the Academy, it is also used as a medium of publicity for the County Society and loyally serves both institutions. The Committee which guides the activities of this Bureau represents equally the County Society and the Academy.

The Committee has felt that the public would be well served if more information was given it on medical matters and when an opportunity arose through the Associated Press to furnish articles to the press on medical matters, it was eagerly seized upon and for over two years Dr. Galdston has prepared a daily health article for the Associated Press which now has the largest circulation of any health column, as it is published in over three hundred newspapers. The question of how these articles could be signed created a little difficulty because the Associated Press insisted that they be signed by name and the County Society felt unwilling to approve of their being so signed. An agreement was finally reached that they should be signed, "Edited by Iago Galdston for the New York Academy of Medicine."

SURVEYS AND INVESTIGATIONS

Comment has already been made of the work of the Public Health Relations Committee in this field. There are two surveys now being carried on at the Academy under grants made by the Commonwealth Fund.

The National Committee on Nomenclature was organized by the Public Health Relations Committee and represents a large number of national associations, including among others the American Medical Association, the College of Surgeons and the Bureau of the Census. It aims to produce and secure the general adoption of a standard form of medical nomenclature.

A study of the causes of puerperal mortality is also being carried out under the direction of a special committee of the Committee on Public Health Relations. Every puerperal death in the city of greater New York will be critically reviewed during the years 1930, 1931 and 1932. This study requires a personal interview with the private or hospital physicians who have had a puerperal death.

When the report of this study is published, it will show conclusively the necessity of better standards of obstetrical care in hospital and private practice.

"What Medicine Can Do for Law," an illuminating address was delivered before the Academy at its Anniversary Meeting in 1928 by Chief Judge Benjamin Cardozo. Two years of discussion and conference between members of the Bar Association and the Academy have resulted in a program of study and its inauguration in the spring of 1931.

The study already demonstrates conclusively the need of changes in the methods of administration of the criminal law and in particular the necessity of requiring qualified psychiatrists to examine defendants accused of capital crimes and felonies. This investigation is being supported by a grant from the Carnegie Corporation.

Poliomyelitis

In the spring of 1928, a special committee was formed under the leadership of Dr. Simon Flexner to carry out a clinical study of the treatment of poliomyelitis in the preparalytic stage with convalescent serum. A limited number of patients were treated in 1928, 1929 and 1930 and a larger number (nearly 600) in 1931. The complete report of the results of this work has not yet been compiled. The total cost of this study to date has been over \$20,000, \$11,500 of which was contributed by an anonymous donor. The balance was obtained by the collection of fees from patients.

SECTIONS AND MEETINGS

The work of the Sections has continued largely as heretofore. An Advisory Committee of five elected by each Section has added further continuity to their work. These committees aid in the development of the Section programs and meet only as occasion demands.

The Chairmen of the Sections are constituted into a standing committee with one of the Vice-Presidents acting as Chairman. This Committee meets with the Program Committee to arrange for a coördinated program and to suggest programs for the Stated Meetings. The Program Committee under Dr. Samuel J. Kopetzky has been fertile in suggestions and contributes a great deal to the improved programs.

Stated Meetings continue, but only once monthly, the meetings of the Harvey Society replacing the second Stated Meeting of each month.

Prior to the moving of the Academy to its new building on One Hundred and Third Street, many Fellows feared a diminished attendance at Academy meetings. This has not been the case for the attendance has steadily increased at nearly every Section meeting until by 1930 the attendance at the Section meetings was more than double what it had been a decade previously, although there was a slight falling off during the year 1931.

The number of medical societies existing in Greater New York is legion. There always will be groups of physicians who organize themselves into special interest groups, or small associations for social purposes or for reasons of local convenience. These many societies serve a useful purpose in supplying a smaller or larger amount of information to their members while the latter have an opportunity to meet their colleagues and engage in friendly intercourse with them. Some of these societies have been outstanding in their efforts to promote scientific knowledge among their members.

The Harvey Society organized under the patronage of the Academy for the purpose of promoting the knowledge of and progress of scientific medicine has become affiliated with the Academy.

The Pathological Society organized prior to the Academy which never found a place in the former practitioner's viewpoint of the Academy has also become affiliated with the Academy and serves in effect as a Section on Pathology.

The New York Section of the Society for Experimental Biology and Medicine, the famous Meltzer Verein, has also affiliated itself with the Academy and is in effect a Section in this important field.

Similarly, the New York Roentgen Society has become affiliated and serves the purpose of a Section on X-ray.

The meetings of all these affiliated societies are open to physicians as are the Academy's meetings and Sections. Membership in these societies, however, remains in accordance with their own by-laws and Fellowship in the Academy gives the privilege of attending the meetings but does not confer the right of membership.

The affiliation of these scientific medical societies with the Academy has furnished a stimulus to the entire Fellowship to look to these societies for leadership in research and scientific investigations. Further, it has stimulated the desire of many laboratory investigators and teachers

with medical and non-medical training to become Fellows or Associate Fellows of the Academy. Many of these trained men and women have become Fellows and have strengthened the Fellowship and aided the Academy with their advice and counsel on many occasions. They serve on the Academy Medal Committee, the Honorary Fellowship Committee, the Gibbs Prize Committee and on various other committees.

PROFESSIONAL STANDARDS

In years gone by, charges of various kinds have been preferred against Fellows of the Academy. Such charges were usually investigated by the Council.

In 1926, charges were preferred against a Fellow which were investigated by a sub-committee of the Council.

Other cases had to be investigated subsequently and after the receipt of the report of the Committee on Activities in 1929, the Council appointed a standing committee on Professional Standards to whom all complaints were to be referred and investigated if necessary for report to the Council. It was clear to the Council that no final action could be taken by the Committee and also that before such action was taken the Fellow under charges should be given the opportunity to appear before the Council and state his own case. This course has been pursued. Most of the complaints that have been made were on the ground of unwarranted publicity and the majority of them were dismissed as the Fellow was usually the victim rather than the cause of the publicity.

Certain rules and regulations were adopted by the Council as well as by the County Society in regard to radio and publicity in general. These rules have been published and need no comment save that it is the opinion of the Council that the Fellows should uphold the honor of the profession as well as keep clear from unnecessary publicity.

No harsh actions have been taken and although several score of complaints have been investigated only four Fel-

lows have been reprimanded, three were allowed to resign, and one suspended for six months, for receiving payment for a signed testimonial.

HONORARY FELLOWSHIP

Prior to 1925, the Council from time to time recommended to the Fellowship the election of certain prominent physicians as Honorary Fellows. It seemed only appropriate at the time of moving into our new building in connection with the ceremonies that a number of new Honorary Fellows be elected.

Accordingly, a special committee was appointed by the Council for this purpose which has remained as a standing committee.

The Committee under the admirable leadership of its first chairman, Dr. Nellis B. Foster, gave some consideration to the type of individual who was on the then list of Honorary Fellows and three names were found on the list about whom no information could be obtained. After a considerable period of time it was learned who one of these individuals was, but in regard to the other two no information could be obtained. As they had been elected many decades before, it had to be assumed that they had departed this life.

It seemed important to the Committee to see that no individuals should be elected to Honorary Fellowship who did not have very definite claims to such a distinction. It was immediately agreed by the Committee that no Fellow of the Academy and no physician residing in Greater New York should be granted such an honor and in this opinion the Council concurred.

ACADEMY MEDAL

It was suggested by Dr. Samuel McCullagh that few medical societies conferred any medal upon their colleagues and he offered to donate a sum of money sufficient to grant a gold medal every year or so. In making a restricted

gift, Dr. McCullagh showed a very broad point of view in specifying in his deed of gift that the medal might be of gold or that two or more medals of silver or bronze might be given at the same time and that the award should be made for scientific or clinical work or for any particular service rendered by a physician in any field. What is still more unusual, he also specified that if in the future the Council felt that such an award was no longer of value, the money could be used for such purposes as the Trustees might determine.

LECTURESHIPS

The Carpenter Lecture was the only endowed lecture which the Academy had and several years ago negotiations were carried on with the Salmon Memorial Committee looking forward to the establishment of the Salmon Memorial in the Academy. It was interesting to note that several of the larger donors to the Salmon Fund emphasized the importance of the funds being established in an endowed institution which seemed likely to continue. It was originally proposed by the members of the Salmon Memorial Committee that the Academy should hold the funds and that the Council would agree to appoint certain individuals who were professors or members of the staffs of certain organizations to act as the Committee. A definite point of policy was made at that time which indicated that if the Academy had control of the fund, it must also have control of who was to spend it and in what manner. When the Committee which had charge of the fund-raising and shaping the use of the endowment learned that they would be the Committee of the Academy, an agreement was promptly reached and the members of the Salmon Memorial Committee became the members of the Salmon Memorial Committee of the Academy.

Other proposed endowments will be discussed a little later.

It is also gratifying to note that the Academy received

a small legacy from the late Dr. L. Duncan Bulkley for an annual lecture on the medical aspects of cancer.

The late Dr. Hermann Michael Biggs had always felt that the rank and file of doctors had little information of the workings of health departments or preventive medicine generally and after his death, Mrs. Biggs gave to the New York Tuberculosis and Health Association a sum of money to endow an annual lecture on some public health topic. It was an odd arrangement that the New York Tuberculosis and Health Association should hold the money and provide the speaker, the County Society furnish the audience and the Academy of Medicine loan the use of its hall. This was pointed out to the representatives of the New York Tuberculosis and Health Association and Mrs. Biggs agreed to have the fund turned over to the Academy which seemed entirely proper to all concerned. She subsequently made an additional donation bringing the endowment up to \$4,000.

GIFTS AND BEQUESTS

Several proposed gifts or bequests were refused by the Trustees and wisely so for the following reasons. A wealthy citizen proposed to leave to the Academy \$200,000 or more, the income of which was to be used by the making of grants to individuals engaged in research in medicine. It was to be stipulated, however, in the will that no grants should be made to Jews or any individual working in an institution which had a Jew as a member of its Board. This proposal was unanimously turned down by the Trustees.

Two proposed endowed lectureships have been refused because the terms of the bequest were entirely unsatisfactory to the Council. Another bequest of an endowed lectureship was refused because although the endowment was sufficient yet the choice of the lecturer and subject was left in the hands of another association. A special committee on Gifts and Bequests was appointed which functioned during the period of study of the Committee on Activities.

At that time, a letter was sent to all the Fellows pointing out the need of unrestricted funds. We should remember that special restricted funds add somewhat to maintenance cost and that arrangements should be made, as has been done in the case of the Salmon lectureship, that five per cent of the income be utilized for the general purposes of the institution.

COMMITTEE ON ADMISSION

Prior to 1926, the Committee on Admission consisted of five Fellows, each one elected to serve a term of five years. It was provided in the Constitution that any physician who was a graduate of five years standing of a recognized medical school was eligible for Fellowship. With this minimum standard, the Fellowship of the Academy was constantly increased prior to the above date and when the Academy moved to 103rd Street, it was still further increased to 1700 resident members, the number of Non-Resident and Associate Fellows being limited as previously to 400 each.

It was the custom to elect as members of the Committee Fellows who represented the different medical schools. There were two matters which deserved special attention. One was the need of a wider representation of specialists on the Committee and the Committee was increased first to nine and subsequently to twelve Fellows serving three years each instead of five. This larger representation has had a noticeable result in that practically every candidate is known to at least one member of the Committee. The Committee saw the necessity of having a personal acquaintance with the candidate and made a rule that no candidate would be considered unless he was personally known to a member of the Committee.

With the larger Committee it has also been possible, when letters have been insufficient or not particularly commendatory, for different members of the Committee to interview the sponsors of the candidates and their acquaint-

ances so as to ascertain definitely the medical and moral qualifications of a candidate.

The increasing number of applicants for admission made it necessary for the Committee to decide upon some standard of selection and it is generally agreed by the Committee that a candidate must have had an internship and hold a hospital, dispensary or laboratory position or have contributed to medical literature or have some other outstanding qualifications. This selective process has resulted in a considerable number of names of candidates being dropped automatically from the list without any adverse vote upon them and it is believed has improved the general quality of the Fellows elected during the last five years.

CLASSIFICATION OF FELLOWS AND SPECIALISTS

Several years ago, the Council noted that the majority of Fellows affiliated themselves with one or more Sections during the month of January of each year, some Fellows becoming members of as many as eight or ten Sections and a question arose as to whether or not a Fellow who was affiliated with a number of Sections felt that he was a specialist in each of the fields represented by those Sections.

At the same time, the Committee on Education was discussing the qualifications for specialists and this idea was further discussed by the Council and it was finally suggested that the Academy might have a new classification of its membership. Namely, that each new candidate for election (some time in the future) be elected as a "Member" of the Academy and that when he had acquired additional experience, the type and amount to be determined, he would be qualified as a "Fellow."

In accordance with the democratic spirit of the Academy, this question was discussed in the Committee on Admission and favorably reported on to the Council. It was also referred to the Committee on Medical Education and

favorably reported on and then referred to the officers of the Sections and the members of the Section Advisory Committees and there also received a favorable report. It was also approved in final form by the Council and by the Academy at the annual meeting in January 1931.

The Sections were then asked to prescribe the qualifications which should be met before a physician should be classified as a specialist in that particular field. This matter has been discussed by a number of the Sections and a few of them have come to an agreement but it will probably be many months more before a final decision can be made and given approval by the Council and also the Academy.

There was also included in this a suggestion that the Academy would recognize an individual who had met the required qualifications and been elected to "Fellowship" and that he would then be known as a specialist in that field.

There was no intent, however, to classify the existing Fellows of the Academy for they have already been elected as Fellows and such title cannot be taken from them as long as they remain in good standing in the Academy.

It is agreed by many physicians that some organization must take the lead in determining who are specialists and undoubtedly, in the course of time, this will lead to additional requirements being exacted by the State for the practice of a given specialty.

THE NEW ADDITION

The plans for the proposed building at 60th Street and Park Avenue called for a far larger building than our present one. The plan had the defect, however, of having a stack which, although larger than our present stack, could never be increased in size when once filled to capacity. This defect was obviated in the present building by having it built in three separate parts—the main building, the stack, and the auditorium wing. It was

obvious to the Council at the time that in this building as constructed there was no room for additional activities or for extending those already agreed upon.

The report of the Committee on Activities which was approved by the Academy at its annual meeting in January 1930, pointed out the need of additional facilities, but owing to what was then believed to be a "depression" the project was postponed. In the spring of 1930, however, on consultation with a number of our friends, it was agreed that it would be wise to go ahead with the project of raising \$750,000 or \$800,000, to be equally divided between endowment and for an addition to the building. The new addition will provide more Library space which is much needed, special rooms for the collection of historical books and incunabula, much needed office space for Academy committees and affiliated societies and several committee rooms. It will also provide some additional exhibit and storage space for exhibit material. This addition is to be built upon the vacant lot to the east of the Academy and over the auditorium, the style of the addition to be in entire keeping with the present building. The plan also visualizes the enlargement of the auditorium in the future.

RELATIONS WITH OTHER SOCIETIES

It has been a source of great satisfaction to feel that the Medical Society of the State of New York, the Medical Society of the County of New York, the First District Dental Society and other organizations make use of our building, and that we come in contact with them, their officers and staff frequently, and that we work in entire accord with these agencies. Nearly all of us here tonight are members of the County Society and we must recognize that from time to time various members of our own County Medical Society are critical of some of the activities or actions of the Academy, and we must also recognize that the reverse is true. It is difficult at times to delimit the activities of the Academy and the County Society so that

they do not overlap. Similarly it is not always feasible to form the organization of joint committees for joint action. The Academy, however, has shown a spirit of coöperation evidenced in many ways. The President of the Academy appoints annually a representative of each of the County Societies of Greater New York on the Public Health Relations Committee. These appointments are made from a list submitted by the President of each County Society.

The Press Relations Committee is a joint committee representing the Medical Society of the County of New York and the Academy, in equal numbers.

The Academy has also aided in the support of Medical Week in order to secure wider publicity for the Academy's meetings and for distributing information more widely in regard to opportunities for clinical and graduate study in New York City.

From time to time members of the County Society who are actively engaged in the administration of that Society have suggested schemes of coöperation for methods or projects which might be undertaken by the Academy. Serious consideration of these questions has frequently led to the conclusion that there are some functions which definitely belong to the County Society and which should not be undertaken by the Academy. It would be apparently simple for the Academy to undertake certain activities, for it is easier for an educational institution of the type of the Academy to obtain financial support, and with its larger staff and stronger organization, it is more readily suited to carry on certain activities. The temptation to undertake such steps, however, has been set aside when it was realized that the function was primarily one of the County Society, even though the Society could not undertake such an activity at that time.

EXPRESSION OF OPINION

The Academy has jealously guarded its expression of opinion on all matters, and does not desire to express its

opinion publicly except for special reasons. The By-Laws provide that no Section shall institute a procedure of public character without approval of the Council, nor may it issue any public statement without such approval. The By-Laws provide that the Public Health Relations Committee may express the opinion of the Academy on public health and hospital matters with the approval of three-fourths of the Committee and the President of the Academy. On all other matters no public expression of the Academy's opinion may be given without the approval of the Council. Although the Council has this authority, yet on a number of occasions it has not made use of it without submitting the question first to the Fellowship. One instance in which this action was taken was in regard to the proposed amendments to Section 7 of the Volstead Act, upon which the Council took no action until it had been voted by the Fellowship.

In the spring of 1931 the Academy published in its Bulletin a statement in regard to birth control which was prepared by the Public Health Relations Committee and unanimously approved by it and also by the Council. This was a modest statement which concerned the medical aspects of birth control. No publicity to this statement was authorized by the Academy, but unfortunately a garbled account of it appeared in only one paper, which brought about some criticism. It was interesting to note that this report was commented on in the weekly magazine "Time," which stated that the Academy was endeavoring to express the opinion of the medical profession. In June the House of Delegates of the American Medical Association passed a resolution, calling to the attention of the members of the American Medical Association that no resolutions of a public character should be presented or adopted by any medical society other than the component societies of the A. M. A. The Academy has no desire to express any opinion in behalf of the medical profession, but it does recognize that with a membership as intelligent and unusual as it has that it may express to the public its own

opinion on matters which relate to medical science in accordance with its Charter secured from the Legislature of the State of New York in 1851. No better example of the expression of opinion can be cited than that expressed by the President in regard to the desire of Drs. Coffey and Humber to exploit their treatment in the State of New York. The opinion expressed by our President was a collective one, obtained from Drs. Francis Carter Wood, James Ewing, Peyton Rous, James B. Murphy, Ira I. Kaplan, the Chairman of the Public Health Committee, the Commissioner of Health and the Commissioner of Hospitals and unanimously approved by the Council.

This long review of the activities of the Academy during the past eight years is the story of progress and with the alliteration of a political party, we may point with pardonable pride to the progress procured. Better organization, better methods and more intensive thought has brought about many changes. Change is not always progress and progress may not be change. Whatever improvement and progress has been made by the Academy is due primarily to brains and intelligently applied interest.

PRACTICAL APPLICATION OF APPROVED SUGGESTIONS

During these eight years, it has been the purpose of the Director to put into effect as rapidly as possible the suggestions laid down by the Committee on Plan and Scope in 1923. Nearly all of the suggestions made in that report have been put into effect. Other suggestions have been made from time to time by Fellows of the Academy and other physicians as well as laymen. It has at times been a long and tedious process to bring about a sufficiently broad discussion of a new suggestion so that the Fellowship at large will be neither shocked, disappointed nor dismayed at the inauguration of a new idea.

The management of an organization such as ours cannot be administered in the same manner as an industrial corporation. Decisions of any importance should not be made

by the Director alone but only after consultation with committees or with the officers of the Academy. For daily guidance, the Director has leaned heavily upon the advice and counsel of the four Presidents under whom he has served and desires to express here his very deep appreciation of the service rendered by Drs. George David Stewart, Samuel A. Brown, Samuel W. Lambert, and John A. Hartwell.

It must not be assumed, however, that there are not many matters of little import which were formerly decided upon by the Trustees or committees which can now, under the budgetary system, be handled by the Executive Officer. This relieves the Trustees and Council and committees of many trivial discussions which formerly took place and which encumbered the minutes of the Council and Trustees for many decades.

No small share of praise is well deserved by Dr. Bryson Delavan, who pointed out the needs of the Academy as early as 1910; Charles Mallory Williams and Haven Emerson, who urged the need of Academy extension; the able scientific leadership of the late Walter B. James during the war period; the broad vision and vivid personality of George David Stewart in the period immediately following the War carried forward the ideas of Dr. Delavan; the vigorous and incisive methods of L. Emmett Holt brought about plans for a new building. Nathan E. Brill, with wise judgment, emphasized the need of a larger site. Without Arthur B. Duel and his power of stimulating the imagination of Henry S. Pritchett, the funds for a new building would not have been secured from the Carnegie Corporation; the energy and persistence of Royal S. Haynes, with his associates on the committee for the Drive of 1923, made it possible for the Academy to secure the Rockefeller endowment; the late Charles N. Dowd, Wendell C. Phillips and Haven Emerson foresaw the need of a Committee on Medical Education and inaugurated movements which resulted in the formation of that Committee. To Ludwig Kast belongs the chief honor in the establish-

ment of the Graduate Fortnight, ably assisted by Drs. Harlow Brooks, Emanuel Lilman and Louis Gross. Charles Loomis Dana and James Alexander Miller have been the leaders in our Public Health Relations Committee and for two decades have carried on this work with notable results. The stimulus to postgraduate study and the need of greater facilities for the training of specialists has been due to the Chairman of the Committee, Dr. Nellis B. Foster, and to the quiet persistence of Dr. Carl Eggers. Our relations with the press are cordial, and the notable improvements in the medical publicity in the press have been due primarily to Dr. Charles Loomis Dana and Dr. Orrin S. Wightman. There are several hundred other Fellows whose names I would like to mention who have brought suggestion, counsel and advice which have been most welcome. Criticism also has not been lacking and has been welcome and always will be.

WHAT OF THE FUTURE

A limited membership society should develop itself in accordance with the desires of its own members. It would appear that there are several tasks which are immediately ahead of us. Our own membership should be developed in such a way that we could recognize specialists and indicate the type of training and qualifications required for practicing a specialty. We should gradually fill up our non-resident and Associate memberships in which there are many vacancies. We should extend to physicians in the Army, Navy and Public Health Service a greater liberality to membership than we now do. A surgeon in one of these services, absent in the Phillipines, Panama or Europe for many years, has no inclination to pay dues during that prolonged period of absence.

We should continue and expand our influence in all matters pertaining to continued medical education and we should seriously consider whether or not we should solicit the coöperation of the medical schools, and from time to time indicate to them our opinion as to the qualifications

of their graduates, and what changes might be made in the medical school curriculum. At the present time this suggestion does not meet with great enthusiasm on the part of the Deans of our medical schools.

The Library is the greatest single instrument that we have for continued education. If funds were available it would be of interest to call to the attention of different groups of Fellows the importance of certain new books and articles. It would be of the greatest service if the Library could serve the Fellows in the same way that an effective departmental library in a medical school or laboratory serves its staff—by furnishing the members with abstracts of articles, or calling their attention to important new articles in the journals. This might be very expensive, but profitable.

The enormous amount of medical literature now available makes it difficult to persuade some physicians to read anything. An effort might be made to ascertain whether or not groups of physicians could be persuaded to read either by the publication and distribution of leaflets, or brief abstracts of articles, and by increasing the circulation of the Library.

There is a definite need of a reading room for physicians in the Bronx and in Queens, and the Kings County Medical Library needs further development. How far and in what way the Academy could coöperate in the development of reading rooms or libraries in other Boroughs must be given further consideration. A medical student should be taught the use of medical literature not only current, but historical, and the Academy might profitably coöperate with the medical school in stimulating this type of activity. Further, we will need an enlargement of the book stack within ten or fifteen years.

The report of the Committee on Activities indicated the further need of continued surveys and investigations in various fields. Several of these have been made by the Academy and there are many opportunities which need

to be explored. The rising mortality from appendicitis, the relations of the public hospital to the private hospital, the expansion of the use of convalescent homes, the increase in the operative death rate in certain conditions—are but a sample of the type of subjects which need investigation.

The employment of temporary staff members has its difficulties. Small groups of investigators are brought together to make a study and when finished, the staff is disbanded, and its members frequently left without work for considerable periods of time. This necessitates the paying of higher salaries for this type of work, and although these studies are financed as a rule by foundations, yet a better service would be performed if the studies could be made not only under the aegis of the Academy, but also with its own funds.

The Academy has one fund, the Gibbs Prize Fund, the income of which is devoted to medical research. Consideration should be given as to whether or not the Academy should solicit or accept funds for the promotion of laboratory research. Many physicians are deeply interested in various aspects of laboratory and clinical research and also, many of them are able to secure funds from their patients or friends to carry on a certain type of research. It is quite likely that some of this research is a matter of either personal interest on the part of the physicians or a duplication of other and better efforts. Whether it would be wise for the Academy to endeavor to coördinate research of this type and to aid physicians with grants is a matter which requires further study.

Museums of various types are of the greatest cultural and educational value. We recognize this in this city in the Museum of Natural History and in the Metropolitan Museum of Art. Suggestions have been made from time to time that the Academy create a museum of medical history or a museum of hygiene and public health. Seven years ago, before we moved into the present building the

Director felt it unwise to consider the creation of a medical museum in the new building primarily for the reason that the Academy was not yet ready to undertake such an enormous task. A medical museum would be of the greatest interest and should serve an educational and cultural purpose. It should have historical sections as well as sections relating to public health and hygiene. It should be a living organism for the better education of medical students, physicians and the public. It would require a building at least as large as the Academy and ultimately a budget fully as large. Museums, however, are usually the result of growth from small beginnings. Dr. Delavan will tell us that the Museum of Natural History began from a small collection of minerals housed in the Arsenal fifty or sixty years ago. The beginnings of a medical museum will be made when some younger Fellow of the Academy or some young physician develops a keen interest in it and has the energy and initiative sufficient to classify and collate the material which we now own, and develop the type of exhibit which we have had in the Graduate Fortnight and extend it, and promote year in and year out the need of such an institution. Such an institution will be developed in the City of New York. Whether it should be developed by the Academy or promoted by the Academy or by an entirely separate group, the future will decide.

STAFF

No organization or institution can function satisfactorily without a competent and loyal staff. In organizations of this type fancy salaries cannot be paid, not even during the "New Era." The rank and file of the clerical staff and of the building personnel can be paid only the current salaries and wages for similar positions in any field of activity.

Recognizing that the more permanent and loyal the staff the more satisfactory the work would be, steps were taken to aid the employees in several different ways.

The Academy as an educational institution became a member of the Teachers Insurance and Annuity Association which was founded by the Carnegie Corporation and most of the staff and some of the employees of the Academy have taken advantage of joining the Association by contributing five per cent of their salary, which is matched by an equal amount paid by the Academy, toward a future annuity upon retirement the amount of which will depend upon the length of service. If the length of service is thirty years the annuity will amount to half pay.

In the case of two individuals, the late Mr. John S. Brownne and Mrs. Laura E. Smith, the Trustees decided to retain their services in a consulting capacity at half pay for life.

Several of the Academy staff having died in service and it having been learned that their families were left in reduced circumstances, it was decided to take out a group insurance policy which entitles each of the staff and employees a policy of from \$500 to \$1,500 depending upon the character of the service of the individual. Payments on these policies are made entirely by the staff.

On several occasions, it was found that members of the staff received unsuitable medical or surgical care and an arrangement was made so that one competent hospital physician should act as the Academy's medical advisor. The arrangement provides that each and every member of the staff and building personnel may consult this physician once during the year for a complete physical examination. In the case of illness of a member of the staff, with the consent of the family physician, the Academy's doctor may call to learn the nature of the illness and its probable duration and also to see to it that the sick individual receives proper hospital care if it is indicated.

These measures have all been deeply appreciated by the staff.

Last year we celebrated the twentieth anniversary of the period of service of Dr. Corwin, whose wisdom in in-

vestigation, whose knowledge of hospital and public health matters, is as wide as that of anyone in New York. He has gradually acquired the confidence of the officials in this city and his continued efforts have been of the greatest service.

Dr. Reynolds' capacity for getting things done smoothly and without apparent effort and his modest and quiet manner have endeared him to many Fellows, and he has steadily brought forward the administrative work of the Clinical Bureau and the Committee on Medical Education to its present state of efficiency.

The advance made by the Library has been due to the intelligent energy of Dr. Malloch, who brought to us an intellectual endowment, broadly trained in clinical medicine, a natural spirit of research and a mind well steeped in the Osler tradition. It is not unnatural that every week a large amount of his time should be taken up by a continued stream of prominent visitors from all parts of the United States and Europe.

Dr. Galdston in the Press Relations Bureau has guided that work with peculiar skill and care. He recognizes constantly the danger of a situation, the possibilities of criticism which may arise at any moment from an unguarded statement which may leak into the press. To him much credit is due for the influence which the Academy now has in this city.

And what we would do without our own Felix I cannot say. Scarcely a Fellow enters the building whom he does not know. He can tell us in a moment all of the details of the lives of most of us. He knows where and how we live, and his never-failing courtesy and tact have endeared him to all of the Fellows over a period of nearly forty years.

No building can be maintained properly without efficient superintendence. Directly or indirectly every Fellow comes in contact with the building staff, and its sat-

isfactory maintenance is due to the efforts of our Superintendent, Mr. Maddocks. No physician in attendance at a meeting is satisfied unless the lights, the lantern and apparatus are all in working order and the staff prompt in their duties. No excuses are accepted if several of the staff happen to be sick or the movie operator fails to appear promptly.

All in all the work proceeds smoothly and should continue to do so. These heads of our different divisions could not do their work promptly or properly without competent assistance, and we are fortunate to have on our staff a number of intelligent women and men who work with loyalty, energy and efficiency, and to them much praise is due.

I cannot close Mr. President, without expressing to you my very deepest appreciation of the service you have rendered to the medical profession and to the City of New York not only during your period of incumbency as President of this great institution, but also as a member of the Public Health Relations Committee. As a member of that Committee and also as President, you have shown the greatest interest in the affairs of the Academy. You have been wise in your counsel. You have been a most excellent and welcome advisor to its Executive Officer, and far more than that, you have by your intellectual power, your impartial judgment and your moral courage, shown yourself to be not only a great leader but a great citizen of this city.

OBITUARY OF DOCTOR WILLY MEYER

While discussing the subject of cancer of the breast at a meeting of the New York Surgical Society held at the Academy of Medicine on February 24, 1932, Doctor Willy Meyer was overcome by a feeling of weakness and in a short time he died as the result of a cardiac lesion. It was a dramatic ending to the brilliant career of this great surgeon, for it was the radical operation for cancer of the breast which first made him famous, and he died while emphasizing the great importance of early and radical operation.

Doctor Meyer was born in Minden, Germany, July 24, 1858. He studied at the Universities of Bonn and Erlangen, graduating at Bonn in 1880. After completing his military service he became an assistant at the surgical clinic of the University of Bonn, serving three years under Doctors Busch, Madelung, and Trendelenburg.

In 1884 he came to America and after devoting two years to general practice, during which period he became acclimated here, he entered the field of general surgery. His first position was that of assistant in the German Dispensary. Then in 1886 he became attending surgeon at the New York Skin and Cancer Hospital, and in 1887, also at the German Hospital, and at the Post Graduate Hospital. From 1886-1893 he was Professor of Clinical Surgery at the Woman's Medical College. He remained active until 1923 when he was retired from his hospital positions on account of having reached the age limit, and thereafter he served these institutions in the capacity of consulting surgeon. He was in addition consulting surgeon to the New York Infirmary for Women and Children, the Hospital for Joint Diseases, Montefiore Hospital and Glens Falls Hospital.

He was a member of many medical and surgical societies, among them the American Surgical, the American Gastro-

Enterological, and the American Urological Associations, and he was one of the Founders of the American College of Surgeons. He was president of the American Association for Cancer Research 1922-1923.

The life and the achievements of Doctor Meyer are closely interwoven with the development of modern surgery in America. He was a surgeon of great ability, untiring energy, and boundless enthusiasm. These qualities made him an indefatigable worker in every phase of surgical progress. He made numerous contributions to surgical literature. His first important work was the development of the radical operation for cancer of the breast. Then his attention was devoted to acute appendicitis and he realized and taught the importance of early operation. He is said to be the first to have practiced catheterization of the ureters in America, and he performed numerous Bottini Operations for hypertrophied prostate.

The development of thoracic surgery in America is inseparably linked with the name of Willy Meyer. He has written extensively on the subject and he was the Founder of the New York Society for Thoracic Surgery, as well as of the American Association for Thoracic Surgery.

His chief interest in surgery rested in the study of cancer and found expression in his last important contribution to the literature in the form of his book entitled, "Cancer," published December, 1930. It deals with the origin of cancer, its development, and its self perpetuation, and speaks of the therapy of operable and inoperable cancer in the light of a systemic conception of malignancy.

As a man Doctor Meyer was respected by all and loved by many. His outstanding qualities were great personal charm and unfailing courtesy to others.

He was married in 1885 to Lilly Ottilie Maass of New York, who died December 8, 1929. He is survived by two children, Marjorie Fanny Flemming, and Doctor Herbert Willy Meyer.

CARL EGGERS

LIBRARY NOTES

The Library has been fortunate enough in the last year to acquire a number of books important for the study of the history of medicine, including modern books of reference, biographies, and original source material for the students who are not content with second-hand information.

The most conspicuous gap on the shelves of our bibliographical section is being filled through the kindness of Dr. Samuel W. Lambert. The Library has never possessed a copy of the catalogue of the British Museum, which is undoubtedly the most useful bibliographical tool in the English language. The new edition when complete will include from one hundred and sixty to one hundred and sixty-four volumes. As yet only two have been received, and it will be several years before the final volumes are published.

Two very interesting volumes were presented by Dr. A. S. W. Rosenbach, the first an item which we have wished for some time to add to our Americana section. It is William Hughes, *American Physician*, London, 1672. The author served on board a vessel engaged in a filibustering expedition in the West Indies and thus became acquainted with American herbs and their medicinal uses. Our copy is bound by Rivière & Son in brown levant with elaborate gold tooling and a design of flowers and leaves inlaid in red and green panels. Another gift from Dr. Rosenbach is Tobias Venner, *Via recta ad vitam longam*, first edition, London, 1620. Venner is said to have built up a large practice by publishing his observations and instructions on foods, diet, etc.

Dr. Margaret Barclay Wilson who presented us with her fine library of books on cookery in 1929, has added more books to this collection. A very nice facsimile of the Basle, 1515, edition of Erasmus on the praise of folly was

published in 1931 by H. Opperman at Basle with an introduction by Heinrich A. Schmid, translated by Dr. Helen H. Tanzer. The copy from which the reproduction was made contains on almost every page marginal drawings by Hans Holbein the younger. These delightful sketches of sixteenth century life, so beautifully executed, may be compared with the rough woodcuts in another volume given by Dr. Wilson. In a book printed by Christian Egenolph one may always expect to find a number of woodcuts, simple and charming, which give glimpses of customs and living conditions four centuries ago. Lobera de Avila, the author, was a Spanish physician whose *Boncket der Hofe* first appeared in Spanish at Augsburg in 1530. Dr. Wilson's copy is one of the second edition of the German translation and was printed by Egenolph at Frankfort in 1551. It is bound in red morocco, gold tooled, with inside dentelle borders.

During the past few months the Library has had on exhibit its most outstanding addition to the portrait collection, a gift of Dr. George Baehr. It is a sketch of the late Hideo Noguchi, the Japanese doctor who lost his life in Africa in the investigation for the cause of yellow fever. C. Le Roy Baldrige, an American, was the artist. He finished it at Accra ten days before Noguchi's death.

Two important acquisitions have been purchased during the year for our Americana collection. The first American herbal was written by Nicolàs Monardes, 1493-1588, a Spanish doctor. The original edition came out in Seville in 1569. It is one of the most valuable of medical Americana and we have been fortunate enough to secure a copy of the third English edition, printed in London in 1596 under the title of *Joyfull Newes out of the New Found Worlde*. The *Charter granted by their Majesties King William and Queen Mary to the Inhabitants of the Province of the Massachusetts Bay in New England* and the *Acts and Laws* of the same colony, Boston, 1726-1735, contain a number of laws which relate to medicine: acts for providing against sickness, for the relief of idiots, for

regulating drains, etc., to prevent persons from concealing small-pox, and a most important early law against the use of lead in pipes to prevent lead poisoning. (See the editorial by Dr. Archibald Malloch in *Annals of Medical History*, n.s. Vol. 3, No. 4, July, 1931, p. 455.)

A tract by Robert Pemel, *De morbis puerorum*, London, 1653, is of great interest in the history of pediatrics, and a description of it appears in Dr. John Ruhräh's, *Pediatrics of the Past*, New York, 1925. Two tracts by Galen, *De differentiis symptomatum* and *De differentiis morborum*, were both printed by the well known Paris printer, Simon de Colines, in 1528. They are bound together in a plain calf binding, typical of ordinary English seventeenth century work, with the arms of Michael Wodhull, 1740-1816, book collector and translator, stamped in gold on the front cover. Our most recent purchase is the *Practica* of Valescus de Taranta, physician at Montpellier in the early fifteenth century. We already have editions of 1490 and 1500. This was published by Johann Cleyn, a German, at Lyons, 1501. The title is printed in red in the form of a triangle and has inscriptions around it in almost undecipherable hands, dated 1511 and 1624. It is in a contemporary binding of stamped calf over boards. The clasps have unfortunately been torn away.

The First District Dental Society has been generous enough to make a valuable contribution of a group of books which are all considered landmarks in the history of dentistry. In this number are: Berdmore, Thomas, *Abhandlung von der Krankheiten der Zähne*, Altenburg, 1771; Brunners, Adam Anton, *Einleitung zur nöthigen Wissenschaft eines Zahnarztes*, Wien, 1766; Carabelli, Georg, *Systematisches Handbuch der Zahnheilkunde*, Wien, 1831 and 1842; Duval, J. R., *Des Accideus de l'Extraction des Dents*, Paris, 1802 and *Le Dentiste de la Jennesse*, Paris, 1817; Geraudly, *Abhandlung von den Zahnkrankheiten*, Strassburg, 1754; Jourdain-Berchillet, A.L.B., *Essais sur la formation des dents*, Paris, 1766.

and *Traité des dépôts dans le sinus maxillaire*, Paris, 1760.

It would be as dull as it would be impossible to list all the many welcome gifts and purchases added in the past year, but each volume finds a place awaiting it on the shelves of our ever increasing historical collection. The proposed extensions to house this important feature of the Library and to take care of the growing number of investigators is a dream which we hope soon will be a useful reality.

GERTRUDE L. ANNAN

RECENT ACCESSIONS TO THE LIBRARY

- Abderhalden, E. Lehrbuch der physiologischen Chemie. 6. Aufl.
Berlin, Urban, 1931, 852 p.
- Aehard, C. Leçons cliniques sur les maladies du sang et des organes
hématopoïétiques.
Paris, Masson, 1931, 270 p.
- Aikens, C. A. The home nurse's handbook of practical nursing. 5. ed.
Phil., Saunders, 1931, 331 p.
- Albrecht, H. U. Die Röntgendiagnostik des Verdauungskanal.
Leipzig, Thieme, 1931, 493 p.
- Ambard, L. Physiologie normale et pathologique des reins. 3. éd.
Paris, Masson, 1931, 502 p.
- American Medical Association. Coöperative Committee on Fractures.
Illustrated primer on fractures. 2. ed.
Chic., A. M. A., 1931, 63 p.
- Areé, J. Publicaciones científicas.
Buenos Aires, de Amorrotu, 1931, v. 1.
- Bérard, L. and Mallet-Guy, P. Exploration fonctionnelle des voies biliaires
et chirurgie.
Paris, Masson, 1932, 362 p.
- Bishop, C. Women and crime.
London, Chatto, 1931, 295 p.
- Bower, A. G. and Pilant, E. B. Communicable diseases, for nurses. 2. ed.
Phil., Saunders, 1932, 358 p.
- Carns, C. G. Vorlesungen über Psychologie.
Erlenbach, Rotapfel, [1931?], 460 p.
- Chamberlain, E. N. A text-book of medicine for nurses.
London, Milford, 1931, 439 p.
- Chevallier, P. and Bernard, J. La maladie de Hodgkin.
Paris, Masson, 1932, 293 p.
- Clarke, E. The fundus of the human eye; an illustrated atlas.
London, Milford, 1931, 51 col. pl.
- Clayton, W. Colloid aspects of food chemistry and technology.
Phil., Blakiston, 1932, 571 p.
- Colyer, J. F. and Sprawson, E. C. Dental surgery and pathology. 6. ed.
London, Longmans, 1931, 908 p.
- Dix, K. W. Zur Psychologie der Reifezeit.
Dresden, Püschel, 1931, 157 p.
- Dos Santos, R.; Lamas, A. C. and Caldas, J. P. Artériographie des mem-
bres et de l'aorte abdominale.
Paris, Masson, 1931, 192 p.
- Dossot, R. and Palazzoli, M. M. Les urétrites chroniques, diagnostic et
traitement.
Paris, Masson, 1932, 342 p.

- Findlay, A. Physical chemistry for students of medicine. 2. ed.
London, Longmans, 1931, 260 p.
- Flury, F. and Zernik, F. Schädliche Gase.
Berlin, Springer, 1931, 637 p.
- Freud, S. Schriften zur Neuroselehre und zur psychoanalytischen Technik (1913-1926).
Wien, Internationaler psychoanalytischer Verlag, 1931, 426 p.
- Garney, C. E. Dosage and solutions. 2. ed.
Phil., Saunders, 1932, 141 p.
- Goldberg, R. W. Occupational diseases in relation to compensation and health insurance.
N. Y., Columbia Univ. Pr., 1931, 250 p.
- Granger, A. A radiological study of the para-nasal sinuses and mastoids.
Phil., Lea, 1932, 186 p.
- Great Britain. Registrar-general. Manual of the international list of causes of death.
London, H. M. Stationery Office, 1931, 146 p.
- Harrower, H. R. Practical endocrinology.
Glendale, Cal., Pioneer Printing Co., 1931, 704 p.
- Hertzler, A. E. Surgical pathology of the female generative organs.
Phil., Lippincott, [1932], 316 p.
- Hogben, L. T. Genetic principles in medicine and social science.
London, Williams, 1931, 230 p.
- Jones, E. On the nightmare.
London, Woolf, 1931, 374 p.
- Kindberg, M. L. La collapsothérapie de la tuberculose pulmonaire. 2. éd.
Paris, Masson, 1931, 181 p.
- Kuré, K. Die vierfache Muskelinnervation.
Berlin, Urban, 1931, 320 p.
- Lakhovsky, G. L'oscillation cellulaire.
Paris, Doin, 1931, 319 p.
- Lewin, L. Phantastica; narcotic and stimulating drugs.
London, Paul, 1931, 335 p.
- Loth, E. Anthropologie des parties molles.
Varsovie, Fondation Mianowski, 1931, 538 p.
- Mahaim, I. Les maladies organiques du faisceau de His-Tawara.
Paris, Masson, 1931, 595 p.
- Marchiafava, E. and Bignami, A. La infezione malarica. 2. ed.
Milano, Vallardi, 1931, 686 p.
- Maurel, G. Chirurgie maxillo-faciale.
Paris, Semaine Dentaire, 1931, 867 p.
- Mégroz, R. L. Ronald Ross, discoverer and creator.
London, Allen, [1931], 282 p.
- Meyer, W. H. Clinical roentgen pathology of thoracic lesions.
Phil., Lea, 1932, 272 p.
- Midwifery, by ten teachers, under the direction of Comyns Berkeley. 4. ed.
N. Y., Wood, 1931, 740 p.

- Morton, H. Diseases of the stomach.
London, Arnold, 1931, 184 p.
- Paton, S. Prohibiting minds and the present social and economic crisis.
N. Y., Hoeber, 1932, 198 p.
- Portmann, G. Traité de technique opératoire oto-rhino-laryngologique.
Paris, Masson, 1932, 2 v.
- Privat, E. The life of Zamenhof.
London, Allen, [1931], 123 p.
- Randall, A. Surgical pathology of prostatic obstructions.
Balt., Williams, 1931, 266 p.
- de Rudder, B. Wetter und Jahreszeit als Krankheitsfaktoren.
Berlin, Springer, 1931, 137 p.
- Scheffel, C. Jurisprudence for nurses. .
N. Y., Lakeside Pub. Co., [1931], 166 p.
- Schmidt, P. The conquest of old age.
London, Routledge, 1931, 314 p.
- Schmitt, W. Kolloidreaktionen der Rückenmarkflüssigkeit.
Dresden, Steinkopff, 1932, 181 p.
- Sicard, J. A. and Gaugier, L. Le traitement des varices par les injections locales sclérosantes. 3. éd.
Paris, Masson, 1931, 129 p.
- Smith, E. B. and Feiling, A. Modern medical treatment.
N. Y., Wood, 1931, 2 v.
- Stiles, P. G. Human physiology. 6. ed.
Phil., Saunders, 1932, 448 p.
- United States. War department. Surgeon general's office. United States army x-ray manual. 2. ed.
N. Y., Hoeber, 1932, 482 p.
- Vaughan, W. T. Allergy and applied immunology.
St. Louis, Mosby, 1931, 359 p.
- Walkhoff, O. Das Problem der dentalen Fokalinfektion.
Jena, Fischer, 1931, 117 p.
- White House Conference on Child Health and Protection. Section II. Public Health Service and Administration. Committee on Public Health Organization. Public health organization. Report of the Committee.
N. Y., Century, [1932], 345 p.
- William J. Matheson Commission, Encephalitis Research. Epidemic encephalitis. . . . Second report.
N. Y., Columbia Univ. Pr., 1932, 155 p.
- Williams, J. F.; Dambach, J. I. and Schwendener, N. Methods in physical education.
Phil., Saunders, 1932, 222 p.
- Wollenberg, R. Erinnerungen eines alten Psychiaters.
Stuttgart, Enke, 1931, 174 p.
- Zondek, B. Die Hormone des Ovariums und des Hypophysenvorderlappens.
Berlin, Springer, 1931, 343 p.

PROCEEDINGS OF ACADEMY MEETINGS

FEBRUARY, 1932

STATED MEETINGS

Thursday Evening, February 4, at 8:30 o'clock

ORDER

- I. EXECUTIVE SESSION
 - Election of Corresponding Fellows
 - Election of Fellows
- II. PAPERS OF THE EVENING
 - Symposium on Malignancies of the Colon
 - a. Pathological aspects, Howard T. Karsner, Western Reserve University
 - b. Early diagnosis, Thomas R. Brown, Johns Hopkins University
 - c. The roentgenologic diagnosis, B. R. Kirklin, Mayo Clinic
 - d. Surgical aspects, Fred W. Rankin, Mayo Clinic

The Harvey Society in affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, February 18, at 8:30 o'clock

The Fifth Harvey Lecture

"FACTORS CONCERNED IN THE EVACUATION OF THE GALL BLADDER"

A. C. Ivy, Chicago

This lecture takes the place of the second Stated Meeting of the Academy for February.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILIOLOGY

Tuesday Evening, February 2, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Cases from the Cornell Clinic
 - b. Cases from the Mount Sinai Hospital
 - c. Miscellaneous cases

SECTION OF SURGERY

No meeting was held in February. This was considered advisable because the subject of the Stated Meeting on the night preceding the date of the regular Section meeting was of particular surgical interest.

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, February 9, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES

II. CASE PRESENTATIONS

- a. A case of astrocytoma with two primary growth centers, Leo Davidoff
- b. Enuclation of a deep-seated frontal lobe tumor, Ira Cohen
- c. Two cases of chronic subdural hematoma, E. D. Friedman

III. PAPERS OF THE EVENING

- a. A study of a thousand cases of acute head injury, Foster Kennedy, S. Bernard Wortis (by invitation)
- b. Moving pictures showing the physiological disturbances which can result from birth injury of the central nervous system, Bronson Crothers, Boston (by invitation)

IV. DISCUSSION, Bernard Sachs, Israel Strauss

SECTION OF PEDIATRICS

Thursday Evening, February 11, at 8:30 o'clock

ORDER

I. CASE PRESENTATION

Congenital syphilis, Stafford McLean

II. PAPER OF THE EVENING

Syphilis in infancy and childhood, Udo J. Wile, Ann Arbor (by invitation)

Discussion, Carroll S. Wright, Philadelphia (by invitation), J. Gardner Hopkins

SECTION OF OPHTHALMOLOGY

Monday Evening, February 13, at 8:30 o'clock

ORDER

The Medical Center and Mt. Sinai Eye Services

I. READING OF THE MINUTES

II. EXECUTIVE SESSION

III. REPORT OF CASES

1. a. Report of a case of hemangioma of the optic nerve sheath, Thomas H. Johnson, Discussion: A. Reese
- b. Report of a case of bilateral ophthalmoplegia externa complicating exophthalmic goiter, Thomas H. Johnson
2. Demonstration of a case of Von Recklinghausen's disease associated with unilateral pulsating exophthalmos, John M. Wheeler
3. A case of disc-like massive exudative degeneration of the fovea, Raymond Pfeiffer (by invitation)
4. On the results obtained by modification of the Guist operation for detachments of the retina, Hugh S. McKeown (by invitation)
- Discussion, Mark J. Schoenberg
5. Isolation for iris prolapse, Rudolf Denig
6. Fundus lesions in the malignant phase of essential hypertension, Isadore Goldstein
- Discussion, Arthur Fishberg
7. a. A new operation for spastic entropion

- b. A new operation on lids for facial paralysis, Julius Wolff
- S. a. Tetany cataract. Post thyroidectomy
- b. A case of Schminke tumor, Kaufman Schulzberg

BEFORE MEETING

The following cases were presented by a slit lamp group:

- 1. Conical cornea; 2. Band keratitis; 3. Blood staining of cornea;
- 4. Synchysis scintillans

Demonstration of slit lamp cases began at 7 p. m. The other patients were available for examination at 7:30 p. m.

SECTION OF MEDICINE

Tuesday Evening, February 16, at 8:30 o'clock

ORDER

PAPERS OF THE EVENING

- I. A case of ulcerative colitis due to chronic Flexner-Y bacillus infection with cure by autogenous vaccine, Thomas T. Mackie
Discussion, William W. Herrick
- II. Rheumatic fever patients treated with and without salicylates, Arthur M. Master, Jesse G. M. Bullowa
Discussion, Leo Kessel
- III. Clinical reactions to vaccines as guides in treatment, William S. Thomas
Discussion, M. D. Tonart, M. Sulzberger
- IV. Lipiodol pneumonography, Milton S. Lloyd (by invitation)
Discussion, Eric James Ryan (by invitation)

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, February 17, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
Sclerosis of the bladder neck; some items in its natural history,
Edward L. Keyes
Discussion opened by Edwin Beer, Henry G. Bugbee

SECTION OF OTO-LARYNGOLOGY

Wednesday Evening, February 17, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
1. Acute suppurative mastoiditis complicated by meningitis—operation—recovery, H. Clifton Luke
- III. PAPERS OF THE EVENING
1. Consideration of immunology in its relation to oto-laryngology:
 - a. Classification and theory of immunology, Ward J. MacNee
 - b. Clinical manifestations, M. A. Ramirez
 - c. Oto-laryngological manifestations in the adult, Gerald Price (by invitation)

- d. Manifestations in children, Marshall C. Pease
- e. Specific therapy, Will C. Spain
- f. Non-specific therapy, Blake F. Donaldson
- 2. Functional examination in tumors of the acoustic nerve with presentation of cases—lantern slide demonstration, Page Northington (by invitation)
- IV. DISCUSSION, Byron Stookey, M. B. Sulzberger, Horace S. Baldwin, Peer Lund (by invitation)

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, February 19, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
- Surgery of the ankylosed (lantern slides and motion pictures) Willis C. Campbell, Memphis (by invitation)

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, February 23, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
- 1. The influence of gynecological conditions on the genito-urinary tract as shown by simultaneous injections of Skiodan (intravenously) with intra-uterine lipiodol (a preliminary report) Arthur Stein, Mortimer Rodgers
- 2. Uretero-vesical anastomosis (result end of 11 years), H. Dawson Furniss
- III. PAPER OF THE EVENING
- The ovarian hormones, Geo. W. Corner, Rochester, N. Y. (by invitation)
- Discussion opened by Robert T. Frank, William Carey (by invitation), Phillip Smith (by invitation), Salvatore di Palma

AFFILIATED SOCIETIES

The New York Roentgen Society in affiliation with the New York Academy of Medicine

Monday Evening, February 15, at 8:30 o'clock

ORDER

- I. 8:30 to 9:00 p.m.
- Demonstration of interesting cases and roentgenograms
- II. 9:00 p.m.
- Bone tumors, Charles F. Geschickter, Baltimore (by invitation)
- New York Meeting of the Society for Experimental Biology and Medicine under the auspices of The New York Academy of Medicine
- Wednesday Evening, February 17, at 8:15 o'clock
- (Incomplete Program)
- I. Single cell dissociation of the mycobacterium of "Rat Leprosy," M. C. Kahn, H. Schwarzkopf

- II. Experiments on immunization with Haptens, K. Landsteiner, J. Jacobs
- III. Relative immutability of hydrogen ion concentration of the bile. Its buffering effect in bactericidal experiments, R. Ottenberg, J. Kahn
- IV. Models showing accumulation, W. J. V. Osterhout, W. M. Stanley
- V. A quantitative relation between the chloride and acid concentrations of gastric juice, F. Hollander
- VI. Anginal syndrome produced by gradual anoxemia, M. A. Rothschild, M. Kissin
- VII. Attempts at treatment of hemorrhagic diathesis by injections of snake venom, S. M. Peck (introduced by L. Gross)
New York Pathological Society in affiliation with
The New York Academy of Medicine
Thursday Evening, February 25, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. Adamantinoma with metastases to the lungs, David Perla (by invitation), Jefferson Borzima
 - b. The dopa reaction in general pathology, George F. Laidlaw
 - c. A simple technique for the dopa reaction, Solon N. Blackberg (by invitation)
 - d. A case of spheroidal carcinoma (seminoma) of the epididymis not involving the testicle, A. A. Eisenberg (by invitation), Harry Wallerstein (by invitation)
 - e. A case of interstitial hypertrophic neuritis, Abner Wolf (by invitation)
-

FELLOWS AND CORRESPONDING FELLOWS ELECTED

CORRESPONDING FELLOWS ELECTED FEBRUARY 4, 1932

Mariano R. Castex.....	Professor of Clinical Medicine, Buen
P. Clerc.....	Professor of Medical Pathology, Buenos Aires
Knud H. Faber.....	Professor of Medicine, Copenhagen
Francisco Maria Fernández.....	Sanitarian, Madrid
John Smith Fraser.....	Oto-Laryngologist, Edinburgh
Paul Govaerts	Internist, Leuven
Cornelius Ubbo Ariens Kappers.....	Neuro-Anatomist, Amsterdam
Leopold Lichtwitz.....	Professor of Internal Medicine, Prague
Henry Francis Moore.....	Professor of Medicine, London
Ernst Peter Pick.....	Professor of Pharmacology, Vienna
Heinrich Poll	Professor of Anatomy, Hamburg
Viktor Gottfried O. Schmieden.....	Professor of Surgery, Frankfurt
Lucas Sierra.....	Professor of Clinical Surgery, San Francisco
I. Snapper.....	Professor of Pharmacology, Amsterdam
Ladislav Syllaba.....	Professor of Pathology, Prague
Joseph Louis Pasteur Valléry-Radot.....	Internist, Paris
Charles McMoran Wilson.....	Dean, St. Mary's Medical School, London

FELLOWS ELECTED MARCH 3, 1932

Lionel Sandler Auster.....	1000 Park Ave.
Charles Frederick Bolduan.....	967 Lincoln Place, Brooklyn
Clarence O. Cheney.....	722 West 168 St.
Ward C. Denison.....	20 East 53 St.
Edward V. Denneen.....	5 East 53 St.
Lawrence S. Kubie.....	34 East 75 St.
Samuel Lubash	2 East 10 St.
Homer L. Nelms	Albany, New York
Page Northington	20 East 53 St.
Charles T. Snyder	7 East 81 St.
Margaret Stanley-Brown	1 East 105 St.
Frank Vero	111 East 75 St.
William L. Watson	1088 Park Avenue
Ellwood C. Weise	Bridgeport, Connecticut
Margaret Barelay Wilson	208 East 15 St.
Morris Zucker	59 East 75 St.

DEATHS OF FELLOWS

WILLIAM BRYAN, M.D., 91 Bard Avenue, New Brighton, N. Y.; graduated in medicine from New York University in 1880; elected a Fellow of The New York Academy of Medicine, March 3, 1901. Dr. Bryan was a Fellow of the American Medical Association and of the American College of Surgeons and a member of the County and State Medical Societies. He was surgeon to the Staten Island Hospital.

WILLY MEYER, M.D., 700 Madison Avenue, New York City; graduated in medicine from the University of Bonn, Germany, in 1880; elected a Fellow of the Academy December 1, 1887; died, February 24, 1932. Dr. Meyer was a Fellow of the American Medical Association, of the American College of Surgeons, and a member of a number of other national medical societies. He was at one time Professor of Clinical Surgery in the Women's Medical College of New York, Professor of Surgery at the New York Post-Graduate Medical School, and was for many years Attending Surgeon to the German Hospital now Lenox Hill Hospital, and the New York Skin and Cancer Hospital.

OFFICERS OF SECTIONS, 1931-32

DERMATOLOGY AND SYPHILOLOGY, 1st Tuesday

Chairman
JOSEPH J. ELLER
100 West 59 Street

Secretary
LEO SPIEGEL
241 West 100 Street

SURGERY, 1st Friday

ROBERT H. KENNEDY
115 East 61 Street

WILLIAM BARCLAY PARSONS, JR.
180 Ft. Washington Avenue

NEUROLOGY AND PSYCHIATRY, 2nd Tuesday

JOSEPH H. GLOBUS
1185 Park Avenue

BYRON STOOKEY
151 East 83 Street

HISTORICAL AND CULTURAL MEDICINE, 2nd Wednesday of November, January, March and May

C. N. B. CAMAC
76 East 56 Street

HOWARD REID CRAIG
175 East 79 Street

PEDIATRICS, 2nd Thursday

HERBERT B. WILCOX
39 East 75 Street

JOHN CAFFEY
Bard Hall, Haven Avenue

OPHTHALMOLOGY, 3rd Monday

MARK J. SCHOENBERG
1160 Park Avenue

ALGERNON B. REESE
73 East 71 Street

MEDICINE, 3rd Tuesday

HAROLD E. B. PARDEE
160 East 64 Street

ROBERT F. LOEB
620 West 168 Street

GENITO-URINARY SURGERY, 3rd Wednesday

MEREDITH F. CAMPBELL
140 East 54 Street

GEORGE F. HOCH
115 East 61 Street

OTO-LARYNGOLOGY, 3rd Wednesday

CHARLES J. IMPERATORI
108 East 38 Street

MARVIN F. JONES
121 East 60 Street

ORTHOPEDIC SURGERY, 3rd Friday

ISADORE ZADEK
1095 Park Avenue

MATHER CLEVELAND
115 East 61 Street

OBSTETRICS AND GYNECOLOGY, 4th Tuesday

GERARD L. MOENCH
30 East 58 Street

FRANK SOVAK
117 East 72 Street

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VIII

APRIL, 1932

No. 4

ANNUAL REPORT FOR THE YEAR 1931

REPORT OF THE COUNCIL*

During the year the Council held seven meetings and transacted the usual routine business. Among the important actions taken was the acceptance of the Salmon Memorial Fund of \$100,000 and the appointment of the Committee to carry out the purposes provided by the donor of the fund. This Committee consisted of Drs. Charles C. Burlingame, Chairman, William L. Russell, Frankwood E. Williams, Haven Emerson and Stephen P. Duggan.

The Council authorized the President and the Executive Officers to take such steps as they deemed proper to oppose the following bills which were under discussion by the State Legislature: A bill prohibiting animal experimentation on dogs was opposed and failed to pass; a bill authorizing osteopaths to use drugs and practice minor surgery was opposed and failed to pass; a bill proposing to license chiropractors was opposed and failed to pass; a bill proposing to restrict physicians in the use of cocaine was opposed and failed to pass.

The Council approved of the recommendation of the Section of Laryngology and Rhinology and the Section of Otolaryngology to combine these two sections into a new section to be known as the Section of Otolaryngology.

The Council approved and authorized the publication of the principles governing contact with the press. It also approved of the publication in the Bulletin of the report of

*The following reports were presented at the Annual Meeting of the Academy, Jan. 7, 1932.

the Public Health Relations Committee on the medical aspects of birth control.

Upon the recommendation of the Committee on Professional Standards it suspended one Fellow for six months and reprimanded one Fellow for having violated the regulations of the Council by authorizing the use of their names in testimonials for which they had received a monetary payment, and two others were forced to resign.

During the year the Council authorized the remission of dues in whole or part for twenty-one Fellows, accepted the resignations of twenty-eight and dropped six Fellows for non-payment of dues. The Council recommended the election of Dr. Margaret Barclay Wilson as a benefactor of the Academy in recognition of her valuable donations to the Library.

At the May meeting the Council authorized the officers to endeavor to raise an additional amount of money for an addition larger than originally proposed. It was expected that \$100,000 more would have to be raised, but building costs were reduced by \$50,000 so that the larger addition can be built for \$400,000, toward which Mr. Edward S. Harkness had previously pledged \$350,000. At a special meeting of the Council held on November 24th it was reported that the new endowment of \$400,000 had been secured or pledged and that \$32,000 was still needed to complete the \$50,000 additional needed for the extension to the building. The Fellows of the Academy were asked to take part in obtaining the balance and their response was prompt and generous so that by the end of the year the balance was assured.

In accordance with the present method of work nearly every matter brought up before the Council for decision has been given careful consideration either by a standing committee of the Academy or a standing committee of the Council. Reference to these activities is made in the reports of the special committees. This has made it possible for the Council to transact a large amount of routine business. One matter has been given serious consideration by the Council

and has also been studied by the Committee on Medical Education, namely, qualifications for Fellowship. The Council has approved of the plan to have all applicants elected as members and subsequently elected as Fellows if and when they have met the qualifications required for Fellowship. These qualifications are being determined by the various Sections and it is hoped that the new plan can be put into effect in the year 1932.

JOHN A. HARTWELL,
President.

REPORT OF THE BOARD OF TRUSTEES

The Trustees are happy to report the fact that the Academy completed the year 1931 without a deficit as shown in the Annual Report of the Treasurer.

Upon the recommendation of the President, the Trustees have appointed Theodore Hetzler as a member of the Advisory Finance Committee. He has shown great interest in the finances of the Academy.

On several occasions the Advisory Finance Committee and the Finance Committee of the Trustees have had meetings and given careful consideration as to what changes should be made in the Academy's investments. It must be recognized that the market values of the bonds and stocks owned by the Academy have suffered a marked shrinkage, but fortunately with the exception of a small amount of railroad stocks, the Academy's income was diminished but little during the year. It was generally agreed by the Advisory Finance Committee that the Academy's investments were in a better situation than those of many institutions.

It is anticipated that the income of the Academy during the year 1932 from endowment will be nearly ten per cent less than in 1931, and this matter was taken in consideration by the Budget Committee. At the December meeting of the Board a budget for 1932 was voted amounting to \$259,465.66 and it is expected that the 1932 income will be of that amount.

During the year the building was kept in good condition, a number of minor repairs made and a considerable amount of painting was done.

The Trustees authorized the use of Hosack Hall without charge to the Medical Society of the County of New York for a meeting on Poliomyelitis and for a meeting in mem-

ory of the late Lee K. Frankel, and to the Housing Association for a public meeting, and to the Mt. Sinai Training School for Nurses for its graduating exercises.

The various endowment funds were increased by approximately \$190,000, \$100,000 of which was donated by the Thomas W. Salmon Memorial Committee for the Thomas W. Salmon Memorial.

The Budget Committee consisted of Drs. Seth M. Milliken, Eugene H. Pool, James Alexander Miller and John A. Hartwell. The Finance Committee consisted of Drs. Seth M. Milliken, James F. McKernon, James Alexander Miller, Samuel W. Lambert, Eugene H. Pool and John A. Hartwell.

The Trustees again express their appreciation of the services of the Advisory Finance Committee consisting of Messrs. James B. Mabon, George Blagden, Moreau Delano, Edwin G. Merrill and Theodore Hetzler.

The Trustees report the following gifts which were received during the year 1931:

FOR ENDOWMENT—

Anonymous donation	\$50,000.00
Emanuel Libman (to complete the W. S. Halsted Fund of \$10,000)	5,000.00
Bequest of the late James B. Clemens added to Public Health Reserve Fund	10,000.00
Thomas W. Salmon Memorial Committee (to be known as Thomas W. Salmon Memorial Fund).....	100,000.00
Mr. W. K. Vanderbilt	2,500.00
Mrs. Harry Payne Whitney	25,000.00
Seth M. Milliken	500.00
Louis F. Bishop	100.00

FOR CURRENT EXPENSES—

Anonymous donation	10,000.00
Altman Fund for current expenses of Library.....	7,500.00

FOR SPECIAL PURPOSES—

Carnegie Corporation for Expenses of Medical Information Bureau	2,500.00
Carnegie Corporation for Medico-Legal study.....	5,000.00
Samuel W. Lambert (for catalog of British Museum)....	200.00

Josiah Macy, Jr., Foundation (for special books).....	500.00
Mrs. Walter M. Brickner (for new books).....	150.00
Milbank Memorial Fund (for Medical Information Bureau)	3,000.00

NOTE—This does not include the pledges and donations toward the new building which will be reported in 1932.

BUDGET 1932 ESTIMATED INCOME

Income on Investments	\$137,000.00
Dues—Members	70,000.00
Contributions	\$10,000.00
“	7,500.00
“	2,500.00
	<hr/> 20,000.00
Assessments—Rooms	15,000.00
Estate Witthaus	5,000.00
Bibliography	3,000.00
Miscellaneous	2,400.00
Photostat	1,500.00
Bank Balance Interest	1,200.00
Bulletins	1,000.00
Dues Library	1,000.00
	<hr/>
Total	\$257,100.00

ESTIMATED EXPENSES

Administration Salaries	\$29,068.80
“ Expenses	6,000.00
Corporation	15,950.00
Building Operation Salaries	28,357.50
“ “ Expenses	14,750.00
Library Salaries	60,624.36
“ Expenses	32,150.00
Sections Salaries	6,550.00
“ Expenses	12,213.00
Medical Education Salaries	16,048.00
“ “ Expenses	12,800.00
Public Health Salaries	15,670.00
“ “ Expenses	1,100.00
Press Relations Salaries	7,184.00
“ “ Expenses	700.00
	<hr/>
Total	\$259,465.66

EUGENE H. POOL,
Chairman.

ALLOCATION OF FELLOWS' DUES FOR 1932

1. For operation of building	
Salaries	\$28,357.50
Expenses	14,750.00
2. Sections and Stated Meetings	11,850.00
3. Maintenance of Membership Bureau and part salary of Comptroller	3,000.00
4. Library Maintenance	7,866.50
5. Fellows subscriptions to Bulletin	4,176.00
	<hr/>
Total sum to be received	\$70,000.00

GIFTS AND BEQUESTS

The Trustees and Council of the Academy report the receipt during the year 1931 of the following gifts:

For Current Expenses:

Academy General Purposes ..	\$10,000.00	Anonymous
Academy General Purposes...	7,500.00	Altman Foundation
Public Health Relations Com- mittee work	7,500.00	Mrs. E. H. Harriman
Press Relations Committee....	5,000.00	Carnegie Corporation
Press Relations Committee	3,000.00	Milbank Memorial Fund
Graduate Fortnight	1,000.00	Josiah Macy, Jr. Foundation
Graduate Fortnight	500.00	Irving Blumenthal

For Special Purposes:

Nomenclature of Diseases Study	\$12,750.00	Commonwealth Fund
Puerperal Mortality Study ...	11,975.00	Commonwealth Fund
Building Fund	11,397.07	Sundry Donations
Poliomyelitis Study	6,500.00	Anonymous
Medico-Legal Study	5,000.00	Carnegie Corporation
Foreign Scholarships	4,000.00	Mrs. Alexander C. Bowen
Books	1,173.31	First District Dental Society
German Books	500.00	Macy Foundation
British Museum Catalog.....	200.00	Dr. Samuel W. Lambert
Books	150.00	Walter M. Brickner Memorial

ABSTRACT OF TREASURER'S REPORT

I have the honor to present the statement of Assets and Liabilities of The New York Academy of Medicine as at December 31, 1931, as follows:

ASSETS

Cash in Banks and on hand.....		\$36,107.05
*Investments:		
Guaranteed Mortgages	\$1,269,450.00	
Stocks (at cost)	883,184.25	
Bonds (at Amortized Value)	741,846.50	
Income Producing Real Estate.....	140,598.93	3,035,079.68
Due from Dr. R. A. Witthaus Estate.....		7,943.28
Estate of Dr. Charles A. Powers.....		1,513.98
Fixed Assets:		
Academy Land and Building at 103rd St. and Fifth Avenue	1,850,621.75	
Library	634,784.91	
Furnishings and Equipment	178,398.11	
Portraits and Works of Art.....	10,250.00	2,674,054.77
Deferred Assets and Prepaid Expenses:		
Unexpired Insurance Premiums	4,122.64	
Dr. William MacNider pre-payment in anti- cipation of 1932 Gibbs Prize Fund Income	185.50	
City Society—January, 1932 payment....	100.00	
Corporation Medal Fund payments applicable Building 1932	85.92	
Library Salaries Study Expense to be received	77.25	4,571.31
Sections Salaries		\$5,759,270.07
Medical Education viewed by members upon application to the Director or		
Public Health Salar. LIABILITIES		
Press Relations Salar.und	\$2,669,905.44	
nt Fund	1,250,000.00	
Total	180,354.72	
Memorial Fund.....	100,000.00	

Edward N. Gibbs Memorial Prize Fund.....	21,482.57	
Public Health Relations Reserve Fund.....	18,268.21	
Building Fund for New Addition.....	11,397.07	
Academy Rare Book Fund	11,006.00	
Alfred Lee Loomis Entertainment Fund.....	11,000.00	
William S. Halsted Fund	10,000.00	
Wesley M. Carpenter Lectureship Fund.....	5,813.09	
Hermann M. Biggs Lectureship Fund.....	4,000.00	
Academy Medal Fund	3,284.57	
L. Duncan Bulkley Lectureship Fund.....	2,000.00	5,647,536.92
<hr/>		
Special Reserve Fund	30,947.25	
For Depreciation of Furnishings and Equipment	33,930.53	64,877.78
<hr/>		
		5,712,414.70
Reserve for Employees' Annuities.....		367.32
Trust Funds:		
New York State Health Commission.....	1,246.25	
Dinner January 7th, 1932	810.00	
Section of Pediatrics	110.28	2,166.53
<hr/>		
Restricted Surplus:		
Maternal Mortality Committee Fund	19,767.76	
Nomenclature of Diseases Committee Fund..	8,095.45	
Thomas W. Salmon Memorial Fund—Income	5,035.00	
Press Relations Bureau Fund	3,619.05	
Medico-Legal Study Fund	3,499.45	
Alexander Cochran Bowen Scholarships	2,350.00	
First District Dental Society Book Fund....	982.79	
Samuel W. Lambert British Museum Catalog Fund	376.15	
L. Duncan Bulkley Lectureship Fund Income	238.50	
Alfred Lee Loomis Entertainment Fund In- come	207.96	
Academy Rare Book Fund Income.....	149.41	44,321.52
<hr/>		
Total Liabilities		\$5,759,270.07

SETH M. MILLIKEN,

Treasurer.

STATEMENT OF INCOME AND EXPENSE

YEAR ENDED DECEMBER 31, 1931

INCOME

Unrestricted:

Dues—Member	\$70,935.00
Library	1,150.00
Income from Investments.....	129,597.04
Room Assessments	15,908.04
Anonymous Contribution for 1931 Expenses..	10,000.00
Contribution from Altman Foundation.....	7,500.00
Bibliography and Photostat Fees	6,375.81
Interest on Bank Balances	1,211.56
Bulletin Subscriptions	1,163.60
Miscellaneous	71.27

243,912.32

Restricted:

Library Funds	\$18,624.69
Public Health Relations Committee.....	18,430.88
Academy Rare Book Fund	744.81
Hermann M. Biggs Lectureship Fund.....	212.00
Academy Medal Fund	174.08
Endowment Fund	\$4,841.31
Poliomyelitis Study Income	14,689.38
Nomenclature of Diseases Committee Fund..	12,750.00
Maternal Mortality Committee Fund.....	11,975.00
Building Addition Fund	11,397.07
Medico-Legal Study Fund	5,000.00
William S. Halsted Fund.....	5,000.00
Alexander C. Bowen Scholarship Fund.....	4,000.00
First District Dental Society Book Fund....	1,173.21
Edward N. Gibbs Memorial Prize Fund.....	1,138.00
Alfred Lee Loomis Entertainment Fund....	583.00
Wesley M. Carpenter Lectureship Fund.....	308.92
Samuel W. Lambert British Museum Catalog Fund	200.00
L. Duncan Bulkley Lectureship Fund.....	106.00
Thomas W. Salmon Memorial Fund.....	105,300.00
Press Relations Bureau Fund.....	8,000.00

304,648.35

Total \$548,560.67

EXPENSE

Administration and General	\$51,213.39
Building Operation	47,444.71
Library	97,093.16
Committee on Medical Education.....	38,490.14
Public Health Committee	17,122.15
Sections and Scientific Meetings	13,540.91

267,904.46

Disbursements from Restricted Income:

Alexander C. Bowen Scholarship Fund.....	2,400.00
Edward N. Gibbs Memorial Prize Fund.....	1,323.50
Academy Rare Book Fund	704.20
First District Dental Society Book Fund....	392.30
Wesley M. Carpenter Lectureship Fund.....	308.92
Hermann M. Biggs Lectureship Fund.....	304.74
Alfred Lee Loomis Entertainment Fund.....	275.00
Academy Medal Fund	260.00
Samuel W. Lambert British Museum Catalog Fund	23.85
Poliomyelitis Study Fund	18,051.48
Maternal Mortality Committee Fund.....	16,708.36
Nomenclature of Diseases Committee Fund..	15,309.66
Press Relations Bureau Fund.....	7,921.73
Medico-Legal Study Fund	1,500.55

Transfers to Principal of Funds:

Thomas W. Salmon Memorial Fund.....	100,000.00	
Endowment Fund	84,841.31	
Building Addition Fund	11,397.07	
Public Health Relations Reserve Fund.....	10,930.88	
William S. Halsted Fund	5,000.00	
Alfred Lee Loomis Entertainment Fund.....	500.00	
Library Funds	45.01	
Edward N. Gibbs Memorial Prize Fund.....	15.85	
Academy Rare Book Fund	11.81	546,130.68

2,429.99

Restricted Income Balances:

	Jan. 1, 1931	Dec. 31, 1931
Maternal Mortality Committee Fund	\$24,501.12	\$19,767.76
Alexander C. Bowen Scholarship Fund	1,050.00	2,350.00
Alfred Lee Loomis Entertainment Fund	399.96	207.96
Samuel W. Lambert British Catalog Fund	200.00	376.15

First District Dental Society Book Fund	201.88	982.79	
L. Duncan Bulkley Lectureship Fund	132.50	238.50	
Academy Rare Book Fund.....	120.61	149.41	
Hermann M. Biggs Lectureship Fund	92.74		
Edward N. Gibbs Memorial Prize Fund	15.85	*185.50	
Nomenclature of Diseases Committee Fund	10,655.11	8,095.45	
Press Relations Bureau Fund.....	3,540.78	3,619.05	
Poliomyelitis Study Fund	3,284.85	*77.25	
Academy Medal Fund		*85.92	
Medico-Legal Study Fund.....		3,499.45	
Thomas W. Salmon Memorial Fund.,		5,035.00	
Totals	\$44,195.40	\$43,972.85	
Add: Decrease of Restricted Income Balances.....			222.55
Excess of Income over Expense applied to Unabsorbed Alteration Expense of Properties at 10-12-14 East 103rd Street—Year 1930			\$2,652.51

*Debit Balances.

SETH M. MILLIKEN.

Treasurer.

STATEMENT OF SPECIAL FUNDS

BALANCES DECEMBER 31, 1931

Library Funds for the General Purpose of the Library:

THE LIBRARY FUND

Balance January 1, 1931 (including bequests of Joseph D. Bryant \$5,648.18 and E. B. Bronson \$5,000.00)	\$48,053.71
Add: Receipts from Sale of Books and Triplicates	45.01
	<hr/> \$48,098.72

HORACE PUTNAM FARNHAM FUND

Gift of Mrs. Eliza C. Farnham, in memory of her husband, Horace P. Farnham, M.D., former Vice-President of the Academy. Established in 1889	10,000.00
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J. MARION SIMS MEMORIAL FUND

Gift of the Sims Monument Committee as a memorial of James Marion Sims, M.D. Established in 1896	100.00
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JAMES S. CUSHMAN FUND

Gift of William F. Cushman, M.D., Treasurer for the Trustees, as a memorial of his brother. Established in 1897	1,000.00
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ORVILLE RANNEY FLOWER FUND

Gift of Governor Roswell P. Flower, as a memorial of his uncle, Orville Ranney Flower, M.D. Established in 1897	1,000.00
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ANNA WOERISHOFFER FUND

Gift of Mrs. Anna Woerishoffer, as a special library fund in recognition of many generous contributions. Established in 1897	15,000.00
--	-----------

WILLIAM T. LUSK MEMORIAL FUND

Legacy and gift of the children of Dr. William T. Lusk. Established in 1898	1,000.00
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GERMAN HOSPITAL AND DISPENSARY FUND

Gift from the Collegium of the Physicians of the German Hospital and Dispensary. Established in 1903	3,000.00
--	----------

ALBERT WILLIAM WARDEN FUND

Legacy of Albert William Warden, M.D. Estab- lished in 1906	1,000.00
--	----------

LONDON CARTER GRAY MEMORIAL FUND

Legacy of Landon Carter Gray, M.D. Estab- lished in 1911	50,000.00
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RUDOLPH WITTHAUS FUND

Legacy of Rudolph A. Witthaus, M.D. Established
in 1917. Principal not received by Trustees,
will approximate \$120,000.00.

Library Funds Restricted to the Purchase of Books:

PHILLIPINE MEYER AND ERNST JACOBI FUND

Gift of Mr. Jacob Meyer and Dr. A. Jacobi. In- come to be used for the purchase of books. Established in 1887	14,486.00
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EVERETT HERRICK FUND

Legacy of Everett Herrick, M.D. Established in 1915	25,000.00
--	-----------

MERRILL WHITNEY WILLIAMS FUND

Gift of Mrs. Robert M. Galloway, as a memorial of her father. Income to be used for the pur- chase of books. Established in 1895.....	220.00
---	--------

ERNST KRACKOWIZER FUND

Gift of the late Ernst Krackowizer, M.D. Income to be used for the purchase of books. Estab- lished as a library fund in 1897. Originally a prize fund	2,000.00
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AUSTIN FLINT MEMORIAL FUND

Gift of certain alumni of the Bellevue Hospital Medical College and friends of Austin Flint, M.D., LL.D. Income to be used for the pur- chase of books. Established in 1910.....	1,200.00
---	----------

Library Funds Restricted to the Purchase of Special Books:

THE BULLOWA MEMORIAL FUND

Gift of Jesse G. M. Bullowa, M.D., and others in memory of their brother, Ferdinand E. M. Bullowa. Income to be used for the purchase of books relating to the Ductless Glands. Established in 1919	1,000.00
---	----------

L. DUNCAN BULKLEY FUND

Bequest of L. Duncan Bulkley. Income to be used for the purchase of books on Cancer. Received in 1929	5,000.00
---	----------

A. L. NORTHRUP DENTAL FUND

Gift of the First District Dental Society, N. Y. Income to be used for the purchase, binding and care of books upon Dentistry. Established in 1897	250.00
--	--------

JAMES P. TUTTLE FUND

Legacy of James P. Tuttle, M.D. Income to be used for the purchase of books on Diseases of the Digestive Tract. Established in 1913	1,000.00
---	----------

 \$180,354.72
Funds Restricted to Special Uses:

Thomas W. Salmon Memorial Fund from Thomas W. Salmon, Inc., to establish fund.....	100,000.00
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ACADEMY MEDAL FUND

Gift of Dr. Samuel McCullagh, \$3,000.00. Balance January 1st, 1931	3,281.57
---	----------

ACADEMY RARE BOOK FUND

Balance January 1st, 1931.....	10,994.19
Add:	
Proceeds from sale of Cardozo Books, donated by Joseph Auerbach, W. D. Guthrie, S. W. Lambert and L. R. Williams	6.00
Contribution from S. W. Lambert.....	5.81
	11,006.00

HERMANN MICHAEL BIGGS LECTURESHIP FUND

Received from Mrs. Biggs and New York Tuberculosis and Health Association in 1930 to establish fund—income to be used for lectures on Public Health and Preventative Medicine	4,000.00
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L. DUNCAN BULKLEY LECTURESHIP FUND

Bequest of L. Duncan Bulkley. Income to be used for lectures on Medical Aspects and Treatment of Cancer. Established in 1929.....	2,000.00
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WESLEY M. CARPENTER LECTURESHIP FUND

Legacy of Wesley M. Carpenter, M.D. Income to be used annually for one Medical Lecture. Established in 1891	5,813.09
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EDUCATIONAL ENDOWMENT FUND (Rockefeller Foundation)
 Balance January 1st, 1931..... 1,350,000.00

EDWARD N. GIBBS MEMORIAL PRIZE FUND
 Gift of Mrs. Edward N. Gibbs and Miss George
 Barker Gibbs (now Mrs. Charles Sherrill).
 Income to be awarded to a research worker on
 Diseases of the Kidney. Established in 1901
 Transferred from 1931 Income Account.... 21,466.72
 15.85 21,482.57

ALFRED LEE LOOMIS ENTERTAINMENT FUND
 Legacy of Alfred Lee Loomis, M.D., ex-President
 of the Academy. Established in 1895..... 10,500.00
 Transferred from 1931 Income Account.... 500.00 11,000.00

PUBLIC HEALTH RELATIONS RESERVE FUND
 Balance, January 1st, 1931 7,337.33
 Add:
 Income from Investments 1931..... 918.88
 Bequest of James B. Clemens..... 10,000.00
 Proceeds of sale of "Hospitals in New
 York" 12.00 18,268.21

Building Fund for New Addition—Subscriptions
 received in 1931 11,397.07

Unrestricted General Funds:

ENDOWMENT FUND
 Balance, Jan. 1st, 1931, including legacies of:
 Everett H. Herrick..... \$25,000.00
 Walter B. James 25,000.00
 Ramon Guiteras 4,911.80
 John T. Nagle 2,500.00
 W. Gilman Thompson 10,000.00
 Seth M. Milliken 2,000.00
 Louis F. Bishop 320.00
 Libbie V. Wagner 25,000.00 1,264,183.94

Add:
 Admission Fees 5,050.00
 Contribution from Anonymous Donor..... 50,000.00
 Gifts—Mrs. Harry Payne Whitney..... 25,000.00
 Wm. K. Vanderbilt 2,500.00
 Dr. Seth M. Milliken 500.00
 Profit on Sale of Investments..... 1,716.31
 1923 Building Fund Subscription of Dr.
 Frank E. McLaury 75.00 1,349,025.25

WILLIAM S. HALSTED FUND

Received from Anonymous Donor to establish Fund	5,000.00	
Received from Dr. Emanuel Libman in 1931....	5,000.00	10,000.00

GENERAL PROPERTY FUND

Balance, January 1st, 1931 (including legacy of Celine B. Hosack \$70,000.00)	2,641,260.10	
Add: Additions to Property purchased out of Income		
Furnishings and Equipment	510.21	
Library	26,932.78	
Purchased out of Restricted Income.....	1,202.35	2,669,905.44

SPECIAL RESERVE FUND

Balance, January 1st, 1931	30,947.25	
Reserve for Depreciation of Furnishings and Equipment	33,930.53	64,877.78
		\$5,712,414.70

SETH M. MILLIKEN,
Treasurer.

AUDITOR'S CERTIFICATE

(Page 6 of their Report)

We have audited the accounts and records of The New York Academy of Medicine for the year ended December 31, 1931, and hereby certify that the Balance Sheet and Statement of Income and Expense herewith submitted, in our opinion, correctly reflect the financial condition as at December 31, 1931, and the results of operations for the year under review, the accounts being kept on a cash basis.

Respectfully submitted,

SEARLE, MILLER & COMPANY.

REPORT ON NEW ENDOWMENT—BUILDING FUND

DECEMBER 31, 1931

ADDITIONS TO ACADEMY FUNDS

By Gifts and Bequests:

Louis F. Bishop—Oct. 1930	\$100.00
Mrs. Clinton B. Wagner—Nov. 1930.....	25,000.00
Dr. Emanuel Libman—Nov. 1930-Jan. 1931	10,000.00
Anonymous—Jan. 1931	50,000.00
Wm. K. Vanderbilt—May 1931	2,500.00
Dr. Seth M. Milliken—March 1931	500.00
Dr. James B. Clemens—Jan. 1931.....	10,000.00
Mrs. Harry Payne Whitney	25,000.00
1923 Building Fund—July 1931	75.00
Thomas W. Salmon Memorial Fund—Jan. 1931.....	100,000.00
Mrs. Hermann Michael Biggs (Biggs Lectureship, 1930)....	1,000.00
N. Y. Tuberculosis and Health Ass'n (Biggs Lectureship, 1930)	3,000.00

Academy Members

	Donations	Pledges
2 at \$2,000.00	\$2,000.00	\$4,000.00
14 at 1,000.00	1,500.00	12,000.00
7 at 500.00	500.00	2,000.00
3 at 250.00		250.00
1 at 200.00		200.00
1 at 150.00	150.00	
20 at 100.00	1,300.00	700.00
1 at 55.82	55.82	
27 at 50.00	600.00	750.00
2 at 40.00	80.00	
114 at 25.00	1,525.00	1,325.00
4 at 20.00	80.00	
6 at 15.00	60.00	30.00
17 at 10.00	120.00	50.00
2 at 5.00	10.00	

Non-Members

Carl Tucker (by Dr. A. B. Duel)	1,000.00
Walter S. Ladd (by Dr. S. W. Lambert)	1,000.00
Edward F. Sheldon (by Dr. J. A. Hart-	
well)	1,000.00
Mrs. Wm. H. Moore (by Dr. A. B. Duel)	1,000.00
Harry M. Stevens (by Dr. M. Goodridge)	500.00
H. J. Gaisman (by Dr. A. A. Berg)....	250.00
George N. Miller (by Dr. E. H. Pool)..	100.00

Physicians Families Relief Fund	316.25		
J. D. Sawyer (by Dr. J. A. Miller)....	100.00		
Ruth Lorrillard (by Dr. G. D. Stewart)	100.00		
E. C. Lindley (by Dr. G. D. Stewart).. <hr/>	50.00 <hr/>		
		23,305.00	
Less Payments on Pledges.....		350.00	
	<hr/>	<hr/>	
	11,397.07	22,955.00	34,352.07
<i>Other Pledges:</i>			
Foundation A	50,000.00		
Milbank Memorial Fund	60,000.00		
Altman Fund	50,000.00		
E. S. Harkness	350,000.00		
Estate S. B. Thorne	5,000.00	515,000.00	
	<hr/>	<hr/>	
<i>From Income:</i>			
Admission Fees June 1930 to Dec. 1931.....	6,200.00		
Special Reserve Dec. 1930.....	5,120.84		
A. L. Loomis Fund March 1931	500.00		
Public Health Reserve—June 1930 to Dec. 1931..	1,389.63		
Gibbs Prize Fund—March 1931	15.85		
Academy Rare Book Fund Dec. 1930 to May 1931	77.81		
Profit on Sale of Bonds—1931.....	1,716.31		
Sale of Triplicates—Oct. 1930 to July 1931.....	160.01	15,180.45	
Reserved for Furniture and Equipment Dec. 1930		8,700.00	
		<hr/>	
Total		800,407.52	

REPORT OF THE COMMITTEE ON ADMISSION

The Committee on Admission reports to the Academy that during the past year 160 applications for membership were considered. Of these 107 were recommended for Resident Fellowship, 13 for Non-resident Fellowship and three for Associate Fellowship; 22 applicants were dropped.

The Committee met each month except during the summer and reports an attendance of nearly 100 per cent. The President and Director were present at almost every meeting. On December 31, 1931, there were 28 vacancies. There are 129 applicants for Fellowship and five for Associate Fellowship now before the Committee.

The Committee goes into most careful detail in considering an applicant's professional qualifications and attainments as well as his ethical standing. This procedure is essential on account of the large number of applicants and the desirability of selecting those who appear most worthy of election.

The Committee seeks the cooperation of the Fellows in asking that they give support to candidates believed to be desirable, and write as fully as possible in regard to them. The Committee also asks that the Fellows exercise greater care in considering whether or not they desire to support a candidate. It has happened on a number of occasions during the past year that one or more of the sponsors of an applicant have withdrawn their approval of the candidate, either verbally or in writing, which is often embarrassing to the Committee.

The Chairman desires to express his appreciation of the work of the Nominating Committee in recommending for membership on the Committee on Admission, Fellows who represent the different fields of medical work, as a result of which, nearly every candidate is known to at least one member of the Committee.

ALEXIS V. MOSCHCOWITZ,

Chairman.

REPORT OF THE COMMITTEE ON LIBRARY

It is gratifying to note that the number of readers has increased from 37,539 in 1930 to 40,412 in 1931. In October there were 4,055 readers, the largest number on record for one month. Over one-sixth of all the readers came to do a special piece of work for a hospital, committee, medical school or laboratory. A more detailed classification employed from November 25th to December 26th showed 2,081 doctors from New York City, 202 doctors from outside, 451 medical students, 213 non-medical students, 301 workers in other sciences than medicine, 14 law workers, 146 secretaries, and 467 others.

GIFTS

The Committee is grateful to those Fellows, publishing houses, and other friends of the Academy who have given books, periodicals, pictures, reprints, old medical instruments, etc., to the Academy. Chief amongst the gifts worthy of special mention is the *British Museum General Catalogue of Printed Books*, of which two volumes have already arrived. They will continue to come during the course of the next eight or nine years until about one hundred and sixty-five volumes have been published. Dr. Samuel W. Lambert, President of the Academy in 1927-1928, a lover of books, is the generous donor of this magnificent work. Another former President, Dr. Charles L. Dana, has sent us a large number of valuable and useful books from his own library. Dr. Dudley Roberts, a Fellow who takes a great interest in the literary work of medical men, past and present, is making a collection of novels, poetry, travels, etc., written by them, and has already given books by the score to the Academy. A second edition of the first text-book on diseases of the heart alone, de Senac, *Traité des maladies du coeur*, Paris, 1777, two volumes, was given to the Library by Dr. Emanuel Libman. Dr. Margaret Barclay Wilson very kindly gave the Academy a copy of a modern facsimile with notes, of the 1515

edition of Erasmus on the praise of folly. This was published in 1931 at Basle by H. Oppermann, and is of especial interest because of the marginal sketches done by the skilful hand of Hans Holbein the younger throughout the copy from which the facsimile was made. Another gift of Dr. Wilson's was a fine copy of Lobera de Avila's *Bancket der Hofe*, printed in Frankfurt by Christian Egenolph in 1551. This is the second edition of the German translation and contains delightful woodcuts which appear in nearly all books printed by Egenolph. The First District Dental Society has been very generous in presenting us with a valuable group of books, selected by Dr. Bernhard W. Weinberger, which are all considered landmarks in the history of dentistry. Among these are: Thomas Berdmöre's *Abhandlung von den Krankheiten der Zähne*, Altenburg, 1771; Adam Anton Brunner's *Einleitung zur nöthigen Wissenschaft eines Zahnarztes*, Wien, 1766; Georg Carabelli's *Systematisches Handbuch der Zahnheilkunde*, Wien, 1831; J. R. Duval's *Des accidens de l'extraction des dents*, Paris, 1802, and *Le dentiste de la jeunesse*, Paris, 1817; Claude Jaquier de Geraudley's *Abhandlung von den Zahnkrankheiten*, Strassburg, 1754; A. L. B. Brechillet Jourdain's *Essais sur la formation des dents*, Paris, 1766, and *Traité des dépôts dans le sinus maxillaire*, Paris, 1760. The Academy was most fortunate in receiving from Dr. George Baehr the sketch made by C. Le Roy Baldridge of Hideyo Noguchi at Accra, Africa, about ten days before his death. Dr. William F. Fluhrer has presented the museum of the Academy with a number of urölogical instruments of his own invention.

PURCHASES

The most important purchases of the year include Robert Pemell, *De morbis puerorum*, first edition, London, 1653, a well known book on pediatrics; the *Charter granted . . . to the . . . Province of Massachusetts-Bay . . . and the Acts and Laws*, Boston, 1726-35, containing several important early American laws which relate to medicine; two tracts of Galen, printed by Simon de Colines, in 1528,

and bound together for the bibliophile, Michael Wodhull, 1740-1816; Nicolàs Monardes, *Joyfull Newes out of the New Found Worlde*, London, 1596, third English edition of the first American herbal; Valescus de Tarauta, *Præctica*, Lyons, Johann Cleyne, 1501, in a contemporary binding of stamped calf over boards, printed a few months too late to include in an incunabula collection.

HISTORY

Our Librarian Emeritus, Mrs. Laura E. Smith, has very kindly run over the old minutes of this Committee, making notes on cards of important decisions or happenings, so that we now possess a history of the Library in outline. At the present time when new methods are adopted, or any old practice is discontinued, a record of the event is made on a card and stored away for future reference.

CATALOGING

In this department optimism reigns, as well it should when one considers that a mountain of work always seems to lie ahead. All the author cards for the Foods and Cookery Collection donated by our Benefactor, Dr. Margaret Barclay Wilson, have been finished. We have begun to reclassify our collections of literary works by doctors, of "medicated" literary works by others, and the collections of histories and bibliographies. The new arrangement will make the use of these books much more handy when our Rare Book and History Room is built. Progress has been made on the duplicate catalog for the new Rare Book Room. A complete author catalog of the rare books has been finished and the copying of cards for books on history, biography and bibliography is under way.

PERIODICALS

In addition to the ordinary work of the Periodical Department, the Russian magazines and books were cataloged this year with the help of a Russian engaged for the purpose. He was especially useful in transliterating titles. Work on the first supplement of the *Union List of Serials* (which tells where copies of magazines can be

found in United States and Canada) was continued, and the report of our holdings made. The *Supplement*, shortly to be published, will bring the list down to 1931 from 1925 when the original *Union List* appeared.

We have completed all our work for the *List of the Serial Publications of Foreign Governments* which is to be published under the auspices of the American Council of Learned Societies. The volume is to appear in 1932.

MISCELLANEOUS

During the year this Committee has discussed a large number of questions and as a result was able in some instances to improve the condition of affairs. Some of these were: To make the magazines in the Periodical and Reading Rooms more accessible to readers; to better the lighting in the Fellows' and Journal Rooms; to shorten the time taken to bind our journals. At the request of the Committee on Maternal Health this Committee has considered the question of the housing of the books on sex questions and of making the suitable ones available to the general reader. A subcommittee has been busy reading these books and compiling a *catalogue raisonné* of them, stating the scope of each work, the class of reader for whom each is intended, and estimating its value.

This Library should possess, or at least have on deposit, old minutes of medical societies and clubs, for such records make history. They are undoubtedly less liable to be lost here than when subjected to the changes and chances of the outside world. We are grateful that some societies have already responded to our appeal for their records.

STATISTICS FOR 1931

Donations

The following publishers have kindly presented complimentary volumes:

D. Appleton and Company....	25	Paul B. Hoeber Inc.	22
Beacon Press Inc.	1	Lea and Febiger	14
Dental Items of Interest Co..	1	Lincoln MacVeagh (Dial Press)	1
Dodd Brothers	1	The Macmillan Company	1
Funk and Wagnalls	1	Oxford University Press	18
E. Haberland	1	W. B. Saunders Company	30
Harper and Brothers	4	William Wood and Company..	8

Donors who have given twenty or more volumes:

American Child Health Association, Van Ingen Library....	389	Dr. John Leshure	31
Dr. Samuel T. Armstrong.....	72	Dr. Charles W. Lester	94
Miss Josephine Atkinson	34	Life Extension Institute	39
Estate of Dr. Walter M. Brickner	423	Dr. Herbert W. Meyer	125
Dr. W. S. Bryant	25	New York City, Dept. Health..	61
Dr. Rufus Cole	35	New York Nursery and Child's Hospital	33
Dr. Lewis A. Conner	21	New York Public Library.....	77
Dr. Charles L. Dana	810	Dr. Adolph Reich	78
Mrs. C. C. Doe	40	Dr. Dudley DeV. Roberts.....	193
Dr. George Draper	97	Rockefeller Foundation	70
Fifth Avenue Hospital	31	Rockefeller Institute	21
First District Dental Society..	129	Dr. Alexander Rovinsky	60
Flower Hospital	24	Dr. Henry M. Silver	67
Dr. Malcolm Goodridge	24	Dr. F. M. Stephens	97
Dr. William Fisher Grier	120	Dr. I. Strauss	30
Dr. F. Grosse	58	Dr. Alfred S. Taylor	73
Mr. E. H. Harris	20	Dr. B. T. Tilton	50
Dr. Henry Landsman	109	Dr. George Gray Ward	35

Donors of large numbers of unbound journals:

American Child Health Association	7505
Archives of Pediatrics	535
Bellevue Medical College	265
Columbia University (College of Physicians and Surgeons).....	422
Cornell Medical College	601
Dental Supply Co.	705
Fifth Avenue Hospital	506
First District Dental Society	453
Life Extension Institute	1008
New York City, Health Department	500
New York City, Municipal Reference Library	834
New York Public Library	239
Rockefeller Foundation	1605
Martin H. Smith Co.	1500

Donors of money:

Dr. Samuel W. Lambert	\$200.00
The Josiah Macy, Jr. Foundation	500.00

Number of donations:

Books	4,369
Journals	43,373
Pamphlets	15,224
Total	62,966

5. Chinese	3	5	8
6. Dutch	16	9	25
7. French	175	33	208
8. German	362	8	370
9. Indian (Asia)	9	11	20
10. Italian	112	42	154
11. Japanese	4	30	34
12. Portuguese (a) Portugal	1	4	5
(b) Brazil	2	22	24
13. Russian	—	8	8
14. Scandinavian	32	12	44
15. Spanish (a) Spain	16	17	33
(b) South America	7	65	72
16. Swiss	14	3	17
17. Miscellaneous (Polish, Hungarian, Rumanian, Czech, Greek, etc.)....	6	58	64
<hr/>			
Total 1931	1142	850	1992
Total 1930	1095	870	1965
New titles added in 1931:			
Journals	177		
Annual reports, etc.	65		
Documents	7		
<hr/>			
Total	249		
Summary of statistics:			
Periodicals received regularly	1992		
Periodicals received irregularly	324		
Annual reports, etc., regularly	541		
Annual reports, etc., irregularly	165		
Documents, regularly	110		
Documents, irregularly	27		
<hr/>			
Total	3159		

Exchanges:

630 copies of the *Bulletin* are sent in exchange for 682 publications of other institutions.

Circulation

	Books	Pamphlets	Journals	Borrowers
1923	3,197	978	3,172	696
1924	3,302	1,130	3,681	720
1925	3,181	1,319	3,708	713
1926	2,453	909	2,825	629
1927	3,178	1,104	3,764	765
1928	3,010	1,014	4,123	733
1929	2,772	872	4,228	765

1930	3,697	1,032	4,915	984
1931	4,458	1,027	6,147	968

Interlibrary Loans

1930	637 books to 57 libraries
1931	820 books to 80 libraries

Reading Room

	Total number of readers	Holidays and Sundays
1923	29,700	526
1924	27,400	587
1925	33,425	708
1926 (moving)	22,350	613
1927	26,093	1,135
1928	29,239	1,519
1929	31,180	1,437
1930	37,539	1,558
1931	40,412	1,408

Finance

Binding (3571 books)	\$8,761.50
Periodicals	10,667.48
Completing files	1,365.05
Books	8,936.63
Miscellaneous	7,013.63
Salaries	60,348.87

Total \$97,093.16

Miscellaneous

1,376 library-cards have been issued to non-Fellows.

22 library-subscriptions were registered, including 13 renewals.

6,692 books and pamphlets were repaired.

The Bibliographical Department carried out 409 pieces of work, among which was the compilation of 76 bibliographies. In addition, about 120 hours' work was done for Academy departments. The year's income was \$4,585.09.

The Photostat Department did 538 pieces of work. The receipts came to \$1,828.11 not including work done for the Academy to the amount of \$69.25.

2,367 theses have been cataloged this year, for which 2,758 cards were sent to Columbia University Library.

The Duplicates Department gave to 67 libraries and four individuals 1,446 volumes, and 6,727 unbound journals.

The library's messenger made 312 deliveries for Fellows, out of a total of 1,269.

The Academy is much interested in the future of the Army Medical Library as a national institution. Dr. Cohn and Dr. Malloch were appointed a committee to inquire into its plans, and visited Washington in April. Amongst others they called on Col. Ashburn, the Librarian. Dr. Malloch attended, as President, the annual meeting of the Medical Library Association held in May at New Orleans.

EUGENE F. DU BOIS,
Chairman.

REPORT OF COMMITTEE ON PUBLIC HEALTH RELATIONS

The following report describing the activities of the Committee on Public Health Relations of The New York Academy of Medicine for the year 1931 has been curtailed in size for economic considerations. Reprints of this report which appears in the Bulletin of the Academy will be available for those who desire to keep a complete file of the reports of the Committee which have hitherto been published separately. In spite of the briefer compass, an attempt has been made not only to give an account of the various matters which have come within the scope of activities of the Committee, but also to set forth a record of the more important public health developments in New York City.

DEPARTMENT OF HEALTH

Budget—The budget for the Health Department for the year 1931 totalled \$5,419,971, which is tantamount to an expenditure of 76 cents per capita. Although the appropriations for municipal public health activities have been increasing, they lagged behind the financial accretions in many other municipal departments. This statement is not meant so much as a criticism, as an indication of the slowness with which the broader and educational phases of public health gain recognition, even in such progressive cities as New York. Mere increases in budget are, of course, no indication of the efficacy of the work and of wise municipal policy. It has always been the attitude of the Academy of Medicine that all departments of the city administration should receive thorough study each year relative to their activities and personnel. It is only too often that an activity, once started, continues by its own momentum indefinitely, irrespective of whether or not the work is carried on efficiently or whether the purpose for which the function was started still exists, or

whether it could be met in some other way. It is with this idea of aiding the departments with which the Academy is particularly competent to deal, that, annually, frequent conferences are held with the Commissioners of the respective departments and their division heads to advise in the husbanding of their resources and in the purposeful planning of their activities. This has been particularly true of the Health Department. Realizing last year that the financial condition of the country generally, and of the City in particular, called for the strictest economy, the Commissioner of Health and the Committee, on which were representatives of the New York Tuberculosis and Health Association, suggested only a few additions to the budget.

The extension of the supervision of children in the continuation schools, the need of a more adequate service in connection with the examinations for the issuance of work permits, and the strengthening throughout of the work of *medical inspection of school children* in elementary as well as in high schools and continuation schools called for a considerable increase of part-time medical inspectors at \$1500. annually, and of 10 new supervisors at \$3000. It was also felt that the Bureau of Child Hygiene, with its many activities, required an assistant director whose salary was set down by the Department at the modest figure of \$3500. per annum.

In the *Nursing Bureau* the need of additional personnel was quite evident for effective work. At the present time the Department employs one nurse for every 10,000 population, which is much below certain other large cities, particularly when it is remembered that these nurses are carrying out numerous duties, to mention only the work in the schools, public and parochial, the home visiting of tuberculous patients, of children requiring correction of defects, and of cases of infectious disease, work in baby health centers, and participation in many other activities of the Health Department. These types of nurse service are particularly demanded in times of economic stress. It

was thought that an additional staff of 200 nurses and 20 supervisors was not at all an extravagance on the part of the City.

Dental Hygiene is a matter on which there is a great deal of discussion, but not much is being accomplished. The establishment of the Murry and Leonie Guggenheim Dental Clinic has added considerably to the facilities available in the city for the poorer children, but the need of further extension of facilities is well-recognized. Conferences with representatives of dental and welfare organizations in the city have prompted the Commissioner of Health to ask for an additional staff of 72 hygienists, 20 dentists, and 7 supervisors to put into motion the dental services in school buildings as well as in the new health centers.

In the *Tuberculosis Division* considerable changes in the organization of the work as well as additions to the staff were recommended. It has been pointed out that the growth in attendance at the tuberculosis clinics has increased by more than 30 per cent in a single year, that there is need of a central registry for tuberculosis records to eliminate duplication in the borough offices, and that consultants in laryngology and roentgenology should be added to the paid clinic staff of the Department.

Recommendations were likewise made for an additional appropriation to the *Bureau of Health Education* to provide for an assistant director and for two editorial assistants to carry on the present duties and to expand them in several directions.

In terms of dollars, the suggested increases in personnel of the Health Department, by bureaus, amounted to \$789,965, subdivided as follows:

Nursing Bureau	\$406,000
Dental Division	134,905
Bureau of Child Hygiene	108,500
Tuberculosis Division	69,380
Bureau of Health Education	25,000

District Health Centers	25,300
Bureau of Records	9,000
Division of Preventable Disease.....	11,880

Only a little more than one-fourth of this amount has been granted by the City. There is evidently a lack of appreciation on the part of the City's appropriating board of the relative values between the numerous and multifarious functions of the city government.

Ultraviolet Therapy—The newspaper reports of experimental work with sun rays, coupled with the commercial exploitation of the various discoveries and the accompanying sales promotion, have induced many persons to apply sun lamp therapy to themselves without proper medical guidance. At the invitation of the Health Commissioner, a study was made of the various problems entering into this question such as the danger involved to the users of the emanations produced by the high powered lamps, the measurement of the radiation of the various types of lamps, and the need of control over distribution and use of the more powerful sources of ultraviolet radiation. The following are the recommendations which were submitted by the Committee to Commissioner Wynne on the basis of this study:

1. That apparatus sold for the emanation of ultraviolet should carry certification of its effectiveness, such as the approval of the Council on Physical Therapy of the American Medical Association.

2. That the actually proven therapeutic benefits resulting from the use of ultraviolet lamps are few; the prevention and cure of rickets, the production of skin erythema, and the questionable effect upon salt metabolism being the most important.

3. That many of the results attributed to ultraviolet radiation are actually due to the accompanying medical supervision, and to the establishment of proper diet and hygiene.

4. That no sweeping statement can be made as to contra-indications on the basis of the existing scientific evidence. As far as can be ascertained, contra-indication depends chiefly on the variation in light sensitivity of individuals, on the bad effects when administered in the presence of certain drugs, and on the presence of chronic disease of degenerative type.

5. That the chief objection to the promiscuous use of ultraviolet lamps lies in the encouragement of self-treatment, and in the resultant delay in securing proper diagnosis and the required treatment.

6. That to offer an opportunity for free ultraviolet radiation to the poor of our tenement districts, through the establishment of so-called "sun-rooms," is a misdirected philanthropic effort. More could be accomplished by regulation of diet and by general hygiene.

Barbituric Acid Derivatives—In accordance with the action taken several years ago concerning safeguards in the indiscriminate sale of barbituric acid derivatives, the Committee endorsed an amendment to the Sanitary Code of the City by which the same restrictions would apply to all such derivatives as have been applicable to the sale of veronal, luminal, sulphonal, trional and tetronal since October 11th, 1922. The Health Department reported that a considerable number of deaths was due to accidental poisoning caused by barbituric acid derivatives and that self-medication with these hypnotics is on the increase. In advising the enlargement of the scope of the existing regulation, the Committee suggested that it should be possible for patients to have written prescriptions for barbituric acid derivatives renewed or refilled without having a special prescription issued each time.

Ringworm—The increasing percentage of fungous infections in relation to all skin diseases seen in clinics and in private practice in New York City suggested an inquiry as to the incidence among the school population. With this end in view, the feet of boys 14 years of age and over, selected at random from the Department of Education Continuation Schools, were examined. The examination, which was made under the direction of Dr. George C. Andrews, consisted of a careful inspection of both feet, particular attention being given to the webs between the toes and the skin at the junction of the toes and the balls of the feet. The condition of the toe nails was also noted. However, since it is practically impossible to differentiate fungous infected nails from other diseases of the nails without the aid of microscopic or cultural study, no record of nail infection was made unless the skin also gave evidence of the presence of fungous organisms. In addition to the inspection, each boy was questioned as to whether

in the past he had noted signs of fungous disease of the feet. The result of the examination was as follows:

Total number examined	520
Number showing clinical signs of fungous disease.....	65 or 12.5%
A past history of active fungous infection given by	31 or 6%
Present evidence of infection shown by.....	10

Among the 65 positive cases, the presence of the disease was manifested chiefly by sodden, macerated, or scaling epidermis of the webs between the toes, or by small fissures in the white, sodden skin of the webs or beneath the toes.

Twenty cases showed signs of nail involvement—chiefly thickening and discoloration of one or more nails which were often striated longitudinally or showed transverse indentations or friable and irregular edges with white powdery scales heaped beneath them. The great majority of the subjects examined were not even aware of the presence of these relatively latent forms of the disease. Only 4 in the entire series presented the more active form of the disease—groups of small vesicles on the toes or soles.

This finding is much below that reported by investigators with regard to college students. There were several reasons to account for this difference, but the factor which seemed to be of most importance was the hygienic habits of the subjects examined. College students took part in athletics and their feet were subject to frequent bathing and the use of a common shower, swimming pool, and bathrooms, as well as the exchange of athletic socks and shoes. The group of New York boys were in a large measure from families rather low in the social scale. The other element is the lower average age of the group as compared with a college group.

Moisture and warmth are two conditions which are especially favorable for the growth of the fungi. This accounts for the fact that fungous disease of the skin is usually intertriginous in origin, appearing most often between the toes or fingers, or in the axillae or groins, and is so prevalent in tropical countries. It is also a matter of common observation that individuals who perspire

freely are particularly susceptible to fungous infections. The conclusions that may be drawn from the study are that fungous diseases of the feet are apparently less common among New York school children than among college students; and that the frequent use of water and an environment of moisture and warmth favor the development of these diseases.

In view of the fact that ringworm is disseminated through wet floors in swimming pools and gymnasias and by bath mats, it was suggested that a notice be placed by the Health Department in public bath houses, giving the cause, prevalence, and mode of transmission of the fungi and suggesting methods of protection. The notice, as formulated, was presented to the Health Department.

Milk—Information was submitted to the Milk Commission appointed by the Health Commissioner, bearing on the results of a study made by the Committee some time ago on certain phases of the loose milk problem. At the Commissioner's request, a special subcommittee was appointed to study the existing situation.

The Health Department Commission unanimously came to the conclusion that loose milk is a potential health hazard sufficient to warrant the discontinuance of its sale except for cooking and manufacturing purposes, and to restaurants, bakeries, and manufacturing establishments which are operated under the regulations of the Board of Health. In view of the prevailing economic conditions, January 1, 1933 was recommended as the date of enforcement of the recommendation for the prohibition of the sale of loose milk. No action on the recommendations has been taken as yet by the Board of Health.

DEPARTMENT OF HOSPITALS

Certain phases of the budget of the Department of Hospitals for the year 1932 were studied in conjunction with the budgets of other City Departments.

Overcrowding—In addition to the broader aspects of the municipal hospital construction program and the or-

ganization in the Department of Hospitals of special clinical divisions, the specific problems with which the Committee dealt this past year were: the *relief of overcrowding in municipal hospitals* and the taking of a census, by services, on a certain day in November; also the passing of a resolution calling upon the Board of Estimate and Apportionment to regard the situation as an emergency and to appropriate funds out of which the private hospitals might be adequately compensated for taking over part of the burden of the municipal hospitals. The Committee urged that the rate of compensation should be more commensurate with actual costs than is the case at the present time. While the average cost of taking care of a patient in a private acute hospital is over \$5.00 per day, and in the municipal hospitals, \$4.50, and more, the payment for an acutely ill patient by the City to a private hospital is but \$3.00, and only \$2.00 for a patient with a chronic malady.

Convalescence.—In view of the fact that a large number of convalescent homes operate only during the summer, and in view of the existing overcrowding in hospitals, a letter was sent out to these homes asking them whether it would be possible for them, for physical as well as economic reasons, to keep their homes open during the winter of 1931-32. The only institution that had the necessary heating installation to enable it to do so is the Seaside Hospital on Staten Island. This institution can accommodate about 200 child patients. The trustees, however, would have been ready to consider taking adult patients during the winter, were the City ready to provide the necessary equipment and to assume the maintenance cost of patients. Likewise, one of the homes for working girls in the City was willing to consider the turning over of the institution for the care of convalescent women, if similar assurance could be obtained from the City that it would pay for actual maintenance. Both of these propositions were referred to the Commissioner of the Department of Hospitals through the intermediary of the Bureau of Hospital Information and Service of the United Hospital

Fund. This Bureau has taken the leadership in the matter of assisting the City to meet the desperate overcrowding in the municipal hospitals which is placing the patients in considerable jeopardy and is breaking down the normal standards of medical and nursing service.

At the request of the Committee, the Council of The New York Academy of Medicine requested the Clinical Sections of the Academy to give consideration to the problem of convalescence in the hope that greater interest in this phase of the work might be taken by the physicians at large.

Proprietary Hospitals—The Committee has kept in close touch with the work done by the Department of Hospitals in supervising proprietary institutions such as sanatoria and maternity homes and other institutions of this character.

STATE DEPARTMENT OF SOCIAL WELFARE

In connection with the foregoing it may be of interest to record that at the 1931 session of the Legislature, a law was passed empowering the State Department of Social Welfare to supervise all the hospitals of the state, irrespective of whether or not they are in receipt of public funds. This law also gives the right to this Department to collect statistics from all the hospitals and, henceforth, the reports of the State Department of Social Welfare will cover the entire field and the value of these publications be considerably enhanced. The Committee urged on the State Department of Social Welfare that their regulations regarding nursing homes and proprietary institutions should be drawn in accordance with the rules which are in effect in New York City.

MUNICIPAL SANITATION COMMISSION

The only phase of the work of the Sanitation Commission to which the Committee gave study was in relation to the methods of the collection and disposal of waste and the cleansing of the streets, which require a great deal of thoughtful consideration.

DEPARTMENT OF EDUCATION

At the request of the trustees of several of the private schools caring for crippled children, a study was made in great detail of the health aspects involved in the schooling of crippled children. A large amount of information was assembled bearing on the situation in the large cities of the country. The subject must be dealt with from three angles: the educational, the medical, and the psychological. A report based on these data is in the process of preparation.

MUNICIPAL CIVIL SERVICE COMMISSION

The application of the principles involved in classifying the medical civil service employees was taken up with the Municipal Civil Service Commission and, as in the years past, the Committee cooperated with the Commission with regard to the setting up of qualifications and considering the types of examination for medical employees in various branches of the city service.

GENERAL ACTIVITIES

Workmen's Compensation—The medical benefits of the Workmen's Compensation Law and the policies of administration with regard to it have been matters which have been before the Academy many times since the enactment of the law in 1911. Last year the Academy, on the recommendation of the Committee on Public Health Relations, forwarded to the Governor the following resolution:

"In view of our belief that the actual operation of the Workmen's Compensation Law at the present time, from the standpoint of public health, is not carrying out fully the spirit and intent of the Act, we respectfully request that a review of the situation in its medical aspects be undertaken, and based on the findings of such a review, recommendations be made to correct the evils of present conditions for the benefit of those injured in industry."

Subsequently, the Governor appointed a committee to review the situation. The following has been suggested as a working basis for the investigation:

1. A survey of 1500 or 2000 finished or closed cases, beginning January 1, 1930, with a follow-up of these cases to find out whether or not the awards were considered by the workmen as just and proper, and also to find out whether the awards were fair from the standpoint of disability.

2. Examination of the first 500 cases "reviewed" from January 1, 1930 for the purpose of ascertaining how long the cases had been subject to review, what delays had occurred, and what hardships were consequent from these delays, with a follow-up of these 500 cases for the same purpose as in number 1.

3. Inspection of the insurance clinics and industrial clinics in New York as to equipment, type of service rendered, type of personnel of doctors employed.

4. Source of origin of cases referred to insurance and industrial clinics, where they had been treated first, and why they had been transferred; the whole subject of the transfer of cases from one agency to another during the course of the case.

5. Consideration of question as to the propriety of insurance doctors being present at examinations of cases in the Compensation Bureau.

6. Review of the occupational diseases listed at present under the law, and a revision of the same.

7. Consideration of the propriety of having the medical records in a case come from the insurance companies' doctors.

8. The consideration as to the propriety of the insurance carriers practicing medicine insofar as they maintain clinics and subsidize doctors to take care of cases.

9. A discussion of the possible advantages or disadvantages of having a special license issued to physicians as qualifying them to take care of compensation cases.

10. A discussion and consideration of the suggestion made that there should be a Medical Supreme Court of Review of cases, and the type of case which should be referred to such a court.

State Health Commission—In February, 1931, the Governor's Special Health Commission presented its report summarizing the pressing, immediate needs of the public health field in the state, and making twelve major recommendations. The recommendation which required legislative action, and which was endorsed by the Academy Committee, related to the organization of county boards of health throughout the state. The present system of town and village boards of health, upon which are superimposed a number of county services, has led to needless confusion and expense without providing adequate public health service. Four counties in the state have organized an effective service by the coordination of existing facilities and by the appointment of full-time health officers. There are many cogent reasons for such organization of health work on a county unit basis. The bill, however, designed to provide for this type of service has not passed the Legislature because of opposition to certain features of the proposed law.

Air pollution—Of the three elements indispensable to life—food, water and air—only the first two have received proper sanitary provision, while the conditions of the outside air have not been placed under proper control. The report prepared by the Committee and published in the Bulletin of the Academy for September, 1931, brought out the need of abatement of the smoke nuisance and the reduction of the dust content of the air. Following the publication of the report, steps were taken to arrange for an exhibition at the Academy, demonstrating the various types of apparatus and machinery available for the control of air pollution and for the conditioning of air in buildings.

Oxygen Therapy—In February, 1931 an exhibit was held at the Academy, dealing with the various types of

oxygen tents and accessory equipment. The standards formulated by this Committee with regard to oxygen therapy were published and submitted to the Council on Physical Therapy of the American Medical Association which is now conducting a study of the merits of the various types of equipment. Requests for copies of the standards have been received from physicians and hospitals in various parts of the country.

Housing—A considerable amount of material has been collected on the relationship of proper housing, light, and air on health. A summary of the published studies has been prepared, showing the general lack of proper scientific approach to this important social and health problem.

At the hearing before the Legislative Committee, the Committee was represented in favor of amendments to the existing law which would provide minimum standards of proper sanitation.

Poliomyelitis—Under the guidance of a special subcommittee, convalescent serum was made available to physicians during the poliomyelitis epidemic. The results obtained are being tabulated.

Maternal Mortality—The second year of the study of maternal mortality in the city consisted of an analysis of 692 cases, making a total of 1367 cases studied during the first two years in the study.

Autopsies—The report dealing with certain phases of the autopsy situation and presenting proposals for cooperative arrangements with undertakers, was published in the Bulletin of the Academy for June, 1931. Demands for copies of this report have come from far and wide. In compliance with the recommendations of the report, and with the approval of the Council of the Academy, a reference committee has been set up under the chairmanship of Dr. George Baehr, under which representatives of the New York Academy of Medicine, the New York Pathological Society, and of hospital administrators and under-

takers will adjust misunderstandings which arise from time to time and hinder the performance of autopsies.

Forensic Medicine—The neglect of properly organized medical jurisprudence services in our communities has been a subject in which the Committee has been interested for many years. In order to encourage a more lively interest in this subject, it was suggested to the officers of the American Medical Association that an exhibit be organized, in connection with the annual meeting, depicting the work and the scientific contributions of the Medical Examiners in the cities of New York, Boston, and Newark, N. J.

Nomenclature Of Disease—The basic work on nomenclature, originated by this Committee two years ago, has been completed. The National Conference on Nomenclature of Disease is publishing a preliminary report, and arrangement has been made for the testing out of the proposed method of recording in a group of selected hospitals.

Blood Transfusion Betterment Association—The Bureau of the Blood Transfusion Betterment Association, which was organized by this Committee, has completed another year of its work, and is rapidly gaining the recognition of the hospitals and medical community of the city. The demands for its high-titred sera for testing purposes are nation-wide.

Automobile Accidents—The gravity of the increasing rate of automobile fatalities and injuries resulting from automobile accidents has led to the appointment of a special committee to study the various problems involved. Both the authorities of the state and of the city charged with the regulation of traffic, conferred with the Committee on the various aspects of the problem. Important statistical data have been assembled and an index of accident preventability has been worked out. A report on the subject is in process of preparation.

Legislation—The Committee took an active part in

dealing with the bills introduced in the Legislature with regard to animal experimentation, chiropractic, the proposed extension of the professional privileges of osteopaths, radio broadcasting by physicians on medical topics, housing, and workmen's compensation. There were also several Congressional bills which called for consideration and action by the Committee. In connection with the whole problem of legislation affecting the public health, recommendations were made by the Committee to the Council of the Academy that an effective *modus procedendi* be organized to deal with various legislative proposals arising every year.

*Need Of Support Of Health And Hospital Activities—*Realizing that the economic depression might affect the usual generosity for public health and hospital activities, the Committee appealed to the public to continue its support and interest. The following was published in the daily press:

"While fully realizing the importance of raising funds for the relief of the unemployed, the Public Health Relations Committee of The New York Academy of Medicine desires to call to the attention of the public how imperative it is that it should not neglect the appeals of the several organizations dealing primarily with the prevention of disease and the promotion of health, as well as those of the United Hospital Fund which collects for 55 hospitals in the city.

"Only those who have participated in the development of the public health movement know what an immense amount of energy and effort has been expended by many workers, over a period of years, before we could reach the high efficiency of our present-day methods of preventing disease and dealing with it when it occurs. The high standards of our hospital service, the ramification of our health educational machinery, and the effectiveness and vitality of organization of our public health movement in its numerous special phases are recognized throughout the

world. In these times it is particularly important that we make every effort to the end that these humanitarian activities shall not fail for lack of necessary support. The unemployment situation has thrown an enormous burden upon all the public health agencies and especially upon the hospitals, while their normal income has been, at the same time, materially diminished. There are more people now, than ever before, who need the aid of the visiting nurse; more people smitten with tuberculosis, or heart disease, or cancer, who require guidance and care; and more people, than formerly, who are obliged to seek free care in our hospitals. All of the agencies dealing with these questions of life and death need funds, and the generosity of the public must supply their needs, lest the people should grievously suffer. Once we allow a weakening in the defenses against the common enemy, disease, it will take many years to repair the resulting damage. It therefore appears to this Committee that one of the most important constructive features of any plan to meet the present economic crisis should be the maintenance of the forces and agencies which are organized to protect the health of our people."

Miscellaneous—Among the other matters which were considered by the Committee during the year were: the proposal for the establishment of a Museum of Hygiene, the unfounded claims for his "Sympathico-thérapie" of Dr. Paul Gillet of Paris, and the proposed Coffey-Humber Cancer Clinic on Long Island which representatives of the Academy, jointly with other medical societies, successfully opposed at the hearing before the State Board of Social Welfare. A report on the medical aspects of birth control was published in the Bulletin of the Academy for the month of April, 1931. The Committee inquired into the medical and health organization of the Police Department, the work of the Children's Bureau of the United States Department of Labor, and considered the question of the alleged adulteration of drugs, particularly ergot and digitalis. The attention of the Committee was also called

to the sale of depilatories containing thallium acetate, which resulted in an inquiry into this subject. The matter of the exploitation of artificially prepared radio-active waters has also been brought to the attention of the Committee.

The second edition of the Committee's book on *Preventive Medicine*, published by Paul B. Hoeber & Company, has been revised and enlarged by three chapters. The Committee discussed the promotion of interest in preventive medicine on the part of the individual practitioners, and a conference on the subject was held with the Commissioner of Health, following which a special committee considered at length the practical phases of this important evolution in the practice of medicine.

The Committee considered the suggestion made by the Merchants' Association of the city that the city's fiscal year be changed from the calendar year to the year ending June 30th, so that preparation of the budget would be made during the late winter and spring months rather than during the summer as at the present time. It was thought that much more attention would be given to the budget if it were considered at a time when everyone was in the city and not away on a vacation.

The Committee also received a gift of \$500 for the relief of physicians which was turned over to the Physician's Loan and Relief Fund.

As may be seen from the perusal of this brief report, the range of activities of the Committee during the past year has been as wide as ever and the Committee likes to believe that its usefulness, if not increasing, is at least not diminishing in the community.

In conclusion, it is important to reiterate the position taken by many thoughtful citizens that in periods of economic stress like the one through which the world has been passing for the last few years, the services which should not be allowed to suffer in scope and intensity are those which come within the generic terms of public health and social welfare.

REPORT OF THE COMMITTEE ON MEDICAL EDUCATION

The Committee's activities of the year may be summarized as follows:

CLASSIFICATION OF FELLOWS

A memorandum submitted to the Council in November of last year embodying the Committee's recommendations regarding the classification of Fellows of the Academy and qualification for Fellowship was approved by the Council and submitted to the Fellowship and to the Sections. In January the proposed new classification for membership in the Academy was announced and was published in the February number of the Bulletin of the Academy.

CORRESPONDING FELLOWS

A list of recommendations for Corresponding Fellows which had been in process of completion for some time was finally submitted to the Council in October.

TRAINING OF SPECIALISTS AND INTERNS

Early in 1929 the Committee decided to undertake an extended study of the training of specialists, to include the nature and the amount of work required and other important matters in connection with the question. Since that time a subcommittee has been actively engaged, has prepared three reports and has made a number of recommendations for continuation of the study. The coordinated assistance of deans of medical schools and representatives of a selected group of hospitals was requested and after conference with these representatives an organization was effected and the "Board for Advanced Medical Education" was formed.

During the current year the Committee has recommended that before proceeding further a thorough survey be undertaken of the opportunities for postgraduate train-

ing which New York hospitals now offer to interns and residents. The Committee's recommendation has been approved by the Council and an effort is being made to secure funds to proceed with the survey.

PROFESSIONAL EXAMINATIONS IN MEDICINE

With the cooperation of the State Department of Education a subcommittee made a preliminary survey of the subject of professional examinations in medicine in this and other states. Evidence was collected dealing in particular with the failure of medical graduates of the United States and foreign countries to pass the State Board Examinations. Through the Director of the Academy the Committee has expressed disapproval of a different standard of licensure in medicine for graduates of American medical schools and those of foreign countries. The Committee has recommended that in the interest of more efficient methods, examiners be interchanged between medical schools. The Committee also expressed its opinion that doctors coming from foreign countries in which American graduates are not permitted to practice should not be permitted to practice in this country.

BULLETIN OF THE ACADEMY

In January the Committee was asked by the President of the Academy to consider whether the monthly Bulletin of the Academy in its present form meets the needs of the Fellows of the Academy; whether size and cost should be reduced, or the Bulletin expanded and developed along other lines, possibly to include abstracts of papers presented at Stated and Section meetings. A subcommittee recommended: (1) that the Bulletin be continued; that its character be gradually changed from that of a house organ to a high class medical publication; that it contain papers presented at Stated meetings and abstracts of papers presented at Section meetings; that it publish reports from a designated authority representing the Trustees and the Council; that it publish book reviews and have an editorial department and policy; (2) that the Council designate an editor who shall have charge of the editorial

THE ALEXANDER COCHRAN BOWEN SCHOLARSHIP

Funds were received from the donor sufficient to provide for two scholarships for a year's foreign study in clinical medicine and surgery. The awards for this year were made to Dr. Henry B. Kirkland and Dr. Charles W. Layne.

POSTGRADUATE OPPORTUNITIES FOR NEGRO PHYSICIANS

In November a group of Negro physicians representing the Society for the Promotion of Negro Specialists in Medicine conferred with a subcommittee in regard to the opportunities offered at present for postgraduate study and the possibility of developing additional ones, qualification for special practice and other matters relating to the practice of Negro physicians. The Committee has decided to continue its cooperation with the group.

POSTGRADUATE COURSES

A local organization requested the Committee's assistance in arranging a course in tuberculosis to be given in several hospitals of the city. In this matter the Committee decided to adhere to the policy which has been followed since the Committee was organized. The Committee will assist by advice and suggestion in the organization of courses and will lend its approval to courses which have met definite standards, but will not undertake to organize courses which are to be given under other auspices.

BUREAU OF CLINICAL INFORMATION

In January, the Council requested the Committee to investigate and report as to how the Bureau of Clinical Information was being utilized, whether it was of educational value to the Academy and whether its operation should be changed in any way. After investigation a subcommittee reported that in its opinion the Bureau of Clinical Information was one of the most constructive parts of the Academy and should be continued.

During the year the Bureau has continued to carry on the functions which were approved by the Committee in

1926,—“To provide a central meeting place or headquarters where visiting medical men may obtain information regarding all medical activities of the city; to collect, classify and give out information regarding opportunities for graduate medical study in cities of the United States, Canada and other countries; to answer inquiries in connection therewith; to publish daily and weekly bulletins of surgical and medical study offered in New York City.”

Visiting medical men who registered in the Bureau during the year numbered 430 of whom 110 came from foreign countries.

The Bureau carries on a considerable correspondence with physicians in all parts of the country who are interested in postgraduate medical study in New York and other cities.

An average of about twenty telephone inquiries are received daily for information on matters connected with the practice of medicine.

Considerable improvement has been made in the Daily Bulletin. In particular, an additional sheet is now being published which lists meetings, lectures, conferences and ward rounds of the city to which all physicians are welcome.

The Bulletin of Approved Non-Operative Clinics has been revised and the requirements for posting in the Bulletin have been raised.

NELLIS B. FOSTER,
Chairman.

REPORT OF THE COMMITTEE ON SECTIONS

During the past year there were fifteen Stated Meetings of the Academy, eight of which were presented by the Harvey Society, three by Sections, one the Annual Meeting, one the Biggs Lecture and one the Anniversary Discourse.

The following Sections cooperated in presenting programs for Stated Meetings: Obstetrics and Gynecology on February 5; Historical and Cultural Medicine on March 5; and the Section of Medicine and the New York Gastro-Enterological Society on April 2.

Attendance at Stated Meetings averaged 184, not including the Harvey Society meetings. A comparison of attendance at Stated Meetings for the past five years is as follows:

1927, average attendance	233
1928, average attendance	216
1929, average attendance	271
1930, average attendance	218
1931, average attendance	184

The Harvey Society, the New York Pathological Society and the New York Roentgen Society presented programs in affiliation with the Academy. The Society for Experimental Biology and Medicine held its meetings under the auspices of the Academy.

At their October meeting the Sections of Otology, and Laryngology and Rhinology decided to combine and to be known as the "Section of Otolaryngology."

The average attendance at Section meetings during the year and the attendance during the two previous years is shown in the following table:

	1929	1930	1931
Section of Dermatology and Syphilology	113	118	123
Section of Surgery	104	121	92
Section of Neurology and Psychiatry	205	180	199
Section of Pediatrics	161	205	165

Section of Otology	56	115	133
Section of Ophthalmology	94	120	120
Section of Medicine	171	213	338
Section of Genito-Urinary Surgery	100	119	242
Section of Orthopedic Surgery	60	89	78
Section of Obstetrics and Gynecology	151	110	198
Section of Laryngology and Rhinology	127	288	160
Section of Historical and Cultural Medicine	72	89	80

The Committee on Sections, which is composed of the Chairmen of the scientific Sections of the Academy with the Second Vice-President as its Chairman, has functioned in cooperation with the Program Committee. It has assisted the Sections and their Advisory Committees in planning programs for Stated Meetings of the Academy and in carrying on certain other Section activities.

LEWIS A. CONNER,
Chairman.

REPORT OF THE COMMITTEE ON PROFESSIONAL STANDARDS

During 1931, the personnel of the Committee on Professional Standards has remained unchanged. It has held six meetings and considered eleven complaints made against Fellows.

Two complaints were made against Fellows for granting the use of their names in testimonials. Upon investigation, it was found that in each case a payment of money had been received which was directly or indirectly for service rendered the advertising company. In each instance the Fellow was requested to withdraw the use of the testimonial and it was recommended to the Council that the Fellow be reprimanded. In one instance the Fellow was reprimanded and the other appearing to the Council more culpable was suspended for a period of six months.

In five instances, a complaint was made in regard to publicity but in each instance it was found that the physician was the victim rather than the promoter of the publicity and in each instance the Fellow was exonerated.

One complaint was lodged against a Fellow by a layman in regard to a bill rendered the physician by the layman for services rendered. The Committee felt that this type of complaint had nothing to do with medical ethics and no action was taken.

Another complaint was made of a physician who was accused of placing posters in factories which gave his name and address and office hours and offered to treat compensation cases. This doctor made the naive defense that because the State Society was opposed to advertising by a physician there was no reason why the Academy should be subservient to the State Society. This physician was reprimanded by the Council and asked to discontinue

his advertising which he did not care to do. He was subsequently forced to resign from the Academy.

One of the Fellows who was reprimanded for receiving money for the use of his name in a testimonial felt unwilling to discontinue this practice and offered his resignation which was accepted.

From the foregoing report, it appears that the Committee finds that many Fellows and physicians who are not members of the Academy are very ready to criticize whenever a physician's name appears in print whether this be in the daily press, in a circular from a pharmaceutical house or in the advertising of a book or what not.

Complaints of this kind are carefully investigated and there is no disposition on the part of the Committee to be critical when it finds that the circumstances under which the Fellow's name appeared were unavoidable and in no way stimulated by him. However, when it appears that a physician has granted the use of his name as a testimonial for which he has received either directly or indirectly a sum of money, the Committee feels that this is contrary to the best interests of the medical profession and recommends appropriate action.

SAMUEL W. LAMBERT,
Chairman

REPORT OF THE COMMITTEE ON MEDICAL JURISPRUDENCE

The personnel of the Committee on Medical Jurisprudence has been changed somewhat during the year 1931 in that there have been added to the Committee Drs. Clarence O. Cheney, George H. Kirby and Vernon C. Branham. Since June 1931, Dr. Dudley D. Schoenfeld has acted as executive secretary to the combined Committees.

Cooperation has continued with the Committee of the Bar Association and also with the Law Department of Columbia University.

Frequent meetings have been held; there has been general discussion and ideas have been gone over pertaining to the large question of mental disease and insanity but no definite crystallized formulae have been evolved. These are under consideration.

The specific work which the Committee has been interested in during the past six months has consisted of a survey of the personnel and the findings, the frequency of appointment of Lunacy Commissions and Commissions in Mental Defect in New York and Bronx counties during the years 1926 to 1930 inclusive. The analysis of this survey is confidential, but the results have indicated a striking need for modification of the procedure and method of appointing a Lunacy Commission.

As a result of the findings in this survey the Medical Jurisprudence Committee of The New York Academy of Medicine and the Committee of the New York Bar Association have agreed on a modification of Section 658 of the Code of Criminal Procedure so that the Commission will have as one of its members a certified psychiatrist. A list of qualifications essential for a certified psychiatrist is included in the recommendation.

The recommendations are being prepared for presentation as a bill to the Legislature by the Bill Drafting Department of Columbia University.

The Committee as a whole feels that if this bill is enacted as law a decided step in the right direction will have been taken.

Conferences have been held with heads of departments who are in some way affected by the work of this Committee. The knowledge and information obtained has been helpful but again of so confidential a nature that it cannot be recorded.

The Committee expects to continue its work along specific lines pertaining to procedure in cases as well as the general question of mental disease and criminal law.

ISRAEL STRAUSS,
Chairman.

REPORT OF THE COMMITTEE ON EDWARD N. GIBBS PRIZE FUND

The income of the Edward N. Gibbs Prize Fund was awarded to Dr. William deB. MacNider of the University of North Carolina for the period October 1930 to October 1931. The Committee also reports that it has made a second award of the income of the Fund to Dr. MacNider for the year October 1931 to October 1932.

RUFUS I. COLE,
Chairman

REPORT OF THE MEDICAL INFORMATION BUREAU

During the calendar year from January to December 1931 the Medical Information Bureau received and handled a total of 2579 inquiries. This is more than twice the number of inquiries received during the previous year.

Eighteen per cent of the inquiries came from newspapers.

Practically every newspaper in Greater New York made use of this Bureau as a source of medical information, for review of medical news items received from other sources and in reviewing advertisements of medical or quasi medical nature.

During 1931 the Bureau issued through the Associated Press a health column which is published daily in approximately 300 newspapers throughout the country.

Fifty per cent of the total number of inquiries came from social and commercial agencies and from individuals, the latter including many physicians.

The National Better Business Bureau has made use of our services, having consulted us on fifty different topics.

Advertising agencies have also presented thirty inquiries.

Three-hundred-fifty-four radio talks were scheduled during 1931 and their delivery supervised over the major radio stations of New York City.

In addition, the Bureau has advised a number of radio stations on certain of their commercial programs. In this work we have had the cooperation of the New York Tuberculosis and Health Association.

The Medical Information Bureau supervised and issued all the news releases covering the Fourth Annual Gradu-

ate Fortnight of the Academy. Fourteen full abstracts of medical contributions were released to the press.

During the twenty-first annual session of the Clinical Congress of the American College of Surgeons the Bureau arranged for twenty-five radio addresses by visiting surgeons over the major stations. The Bureau also cooperated in arranging for and supervising the issuance of news in connection with the Congress.

The issuance of medical news during the annual meeting of the First and Second District Dental Societies was also supervised by this Bureau.

In May, through the courtesy of Dr. Orrin Sage Wightman, who was the host, a dinner meeting was held at the Academy at which representatives from the city press met with the officers of the Academy and the members of the Press Relations Committee to discuss further developments of the Medical Information Bureau.

A set of principles governing contact of physicians with the public through the press-lecture platform, lay periodicals and radio were formulated, and after approval by the Council of the Academy and the Comitia Minora of the Medical Society of the County of New York, were published in pamphlet form and distributed throughout the country to all medical libraries, newspapers and welfare organizations.

Throughout the year the Medical Information Bureau has served the Medical Society of the County of New York in presenting its activities to the press. Nine releases were issued on behalf of the County Society, including the addresses of Dr. Heyd and Dr. Kopetzky.

The Bureau has continued to receive splendid cooperation from its consultants.

JOHN J. MOORHEAD,
Chairman.

REPORT OF OFFICES AND MEETINGS AT THE ACADEMY

During the year the following organizations have maintained their offices in the Academy building:

American Otological Society, Inc.
First District Dental Society
Medical Society of the County of New York
Medical Society of the State of New York
National Committee on Maternal Health, Inc.
New York Physicians' Mutual Aid Association
New York Society for the Relief of Widows and Orphans of Medical Men
New York State Journal of Medicine

Meetings have been held in the Academy building by the following organizations:

American Heart Association, Inc.
American Hungarian Medical Association
American Pharmaceutical Association, New York Branch
American Society of Regional Anesthesia
American Urological Association, New York Branch
Association of Italian Physicians in America
Baltimore Medical Club
Board of Education, Health Education Lecture
First District Dental Society, General and Sections
German Medical Society
Harlem Dental Society, Economic Committee
Joint Diseases Hospital
Medical Association of the Greater City of New York
Medical Board of the Montefiore Hospital
Medical Society of the County of New York, General and Committees
Medical Society of the State of New York, Committees
Mount Sinai Hospital, School of Nursing
New York Academy of Pharmacy
New York City Cancer Committee of the American Society for the Control of Cancer
New York City Committee on Mental Hygiene
New York Neurological Society
New York Physical Therapy Society
New York Psychoanalytic Society
New York Society of Anesthetists
New York Society for Clinical Psychiatry

New York Society of Graduates in Medical Gymnastics and Massage
New York Society for the Relief of Widows and Orphans of Medical Men
New York Society for Thoracic Surgery
New York State Association of Occupational Therapists
New York Surgical Society
New York Tuberculosis and Health Association, Committee on Cardiac Clinics
Pan American Medical Association, New York Chapter
Psychological Corporation
School Physicians Association
Society of Medical Jurisprudence
Spanish American Medical Society
Speedwell Society
Veterinary Medical Association of New York City
Women's Medical Association of New York City

Accommodations, free of charge, have been granted during the year to:

Governors' Health Commission
Governors' Personnel Training Committee
Harvey Society
Housing Association of the City of New York
Manhattan State Hospital, Board of Visitors
New York City Conference of Social Work
New York Pathological Society
New York Roentgen Society
New York Meeting of the Society for Experimental Biology and Medicine
New York State Board of Medical Examiners, Medical Grievance Committee

The following Memorial Meetings have been held:

Dr. Lee Frankel

Dr. Thomas W. Salmon

OBITUARY, 1931

FELLOWS AND ASSOCIATE FELLOWS

Bell, F. McKelvey	Koch, Louis A.
Blosser, Roy	Lampe, Herman F.
Broder, Charles B.	Lau, Frederick T.
Burnham, Herbert D.	Lobenstine, Ralph W.
Chamberlin, Carlross J.	Lockwood, George R.
Cohen, J. Bernard	Mackenty, John E.
Cole, Carter S.	Mayer, Emil
De Vecchi, Paolo	Munn, John P.
Dowd, Charles N.	Polak, John O.
Draper, John W.	Reilly, Thomas F.
Elliot, George T.	Roberts, George W.
Evans, Samuel M.	Scott, George
Fisk, Arthur Lyman	Shenier, Leo H.
Fisk, Eugene L.	Stark, Meyer M.
Fitch, Allen	Stowell, William L.
Fox, George Henry	Thomson, Edgar S.
Goffe, J. Riddle	Wight, Jarvis S.
Grattan, James Francis	Wilson-Prevost, Charles A.
Haubold, Herman A.	Wilson, Norton L.
Kellogg, Theodore H.	Wilson, William A.

Total, 40

FELLOWS AND ASSOCIATE FELLOWS ELECTED IN 1931

FELLOWS

Ager, Louis C.	Garvin, Helen
Allen, Philip Daly	Ginsburg, Sol W.
Andersen, Dorothy H.	Goldbloom, A. Allen
Anderson, Alan R.	Goodman, Henry I.
Anopol, George	Greenhouse, Charles A.
Arnowich, Julius	Grinnell, Robert S.
Bedell, Arthur J.	Harris, Augustus
Bierman, William	Harvey, Harold D.
Bourke, Victor G.	Heyl, James Harry
Bradner, Renfrew	Hirst, Virginius B.
Brandon, William R.	Howell, John Taylor, Jr.
Bruce, Gordon M.	James, Bart Mulford
Buckstein, Jacob	Jungeblut, Claus W.
Bullwinkel, Henry G.	Kesten, Beatrice M.
Carty, John Russell	Kesten, Homer D.
Cashman, George A.	Kimball, Francis N.
Chaney, L. Beverley	Knauth, Marjorie Lord
Coburn, Alvin F.	Koffler, Arnold
Cracovaner, Arthur J.	Lally, Jordan
D'Alton, Clarence J.	Lane, Clarence Guy
Danzis, Max	La Rotonda, Oswald
Davidoff, Leo M.	Lenz, Maurice
Davidson, Morris	Levine, Joseph
Depping, Charles W.	Logie, H. Burton
Egglee, Edward P.	Loizeaux, Leon S.
Falk, Emil A.	Lowrey, Lawson G.
Findley, Robert T.	MacGregor, J. Arnot
Finkle, Philip	McKiernan, Robert L.
Fishberg, Ella H.	McLave, Evan W.
Freston, Julian M.	Madill, Grant C.
Fuller, Clarence C.	Masterson, John J.
Gais, Elmer S.	Merrill, E. Forrest
Galdston, Iago	Meyer, William Henry

Miller, Laura	Schilder, Paul F.
Millet, John A. P.	Selinsky, Herman
Moretsky, Henry M.	Senger, Fedor L.
Morse, Russell Wright	Severance, Robert
Neivert, Harry	Sheldon, Paul B.
Nicholls, Edith E.	Shore, Benjamin R.
Oberrender, Girard F.	Stainsby, Wendell J.
Paige, Beryl Holmes	Stimson, Barbara B.
Parsons, C. J. F.	Sulzberger, Marion B.
Peck, Samuel M.	Tickle, Thomas G.
Peters, Frank H.	Touroff, Arthur S. W.
Pope, Edgar M.	Van Dyck, Laird S.
Potter, Howard W.	Voss, Fred H.
Pound, Robert E.	Wachsmann, Siegfried
Pratt, George K.	Wade, Preston A.
Prewitt, Proviso V.	Wallace, Robert Pulley
Ralli, Elaine P.	Warner, George H.
Ratnoff, Nathan O.	Webb, Gerald Bertram
Reich, Arthur M.	Wexler, David
Rivers, Thomas M.	Wilmoth, Clifford Lee
Ross, William H.	Wollner, Anthony
Russell, Frederick F.	Wood, Paul M.

Total, 110

ASSOCIATE FELLOWS

McFarland, Ross A., Ph.D.	Shuman, Harry Benjamin,
Paynter, Richard H., Ph.D.	D.M.D.

Total, 3

COMPLETE ACADEMY FELLOWSHIP

RESIDENT FELLOWS

1913 Abbott, Theodore J.	1923 Andrews, George C.
1901 Abraham, Joseph H.	1931 Anopol, George
1910 Abrahamson, Isador	1909 Aranow, Harry
1917 Abramowitz, E. Wm.	1918 Armstrong, Arthur S.
1921 Adair, Frank Earl	1924 Armstrong, Donald B.
1901 Adams, Charles F.	1922 Armstrong, Edgar B.
1905 Adams, Warren S.	1917 Armstrong, Edward McP.
1916 Addoms, Lewis P.	1931 Arnovich, Julius
1909 Agatston, Sigmund A.	1928 Aronson, Louis S.
1907 Albee, Fred H.	1889 Aronson, Moses
1928 Aldridge, Albert H.	1913 Asch, Joseph Jefferson
1918 Alexander, Lawrence D.	1919 Aschner, Paul W.
1905 Alger, Ellice M.	1900 Ashley, Dexter D.
1920 Allen, Frederick M.	1928 Ashton, Leslie Orrel
1931 Allen, Philip Daly	1930 Atchley, Dana W.
1930 Allen, Theophilus Powell	1921 Atkins, Richard T.
1881 Allen, Thomas H.	1898 Atkinson, James Wm.
1929 Allison, Benjamin Roy	1919 Atonna, Carmelo
1911 Almgren-Dederer, Ebba E.	1910 Auchincloss, Hugh
1928 Almour, Ralph	1912 Auerbach, Julius
1930 Alofsin, Louis M.	1909 Avery, Oswald T.
1921 Altman, Emil	1918 Babcock, James W.
1930 Amberson, J. Burns, Jr.	1918 Baehr, George
1915 Ames, Thaddeus H.	1916 Bailey, Cameron V.
1915 Amey, J. Willis	1901 Bainbridge, William Seaman
1918 Amster, J. Lewis	1918 Bainton, Joseph H.
1931 Andersen, Dorothy H.	1904 Baker, S. Josephine
1931 Anderson, Alan R.	1921 Baketel, H. Sheridan
1918 Anderton, Walter P.	1924 Bakwin, Harry
1924 Andresen, Albert F. R.	1900 Baldwin, Helen
	1927 Baldwin, Horace S.
	1927 Balensweig, Irving

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| 1907 Ballin, Milton J. | 1904 Bell, George H. |
| 1914 Bancroft, Frederic W. | 1897 Bell, J. Finley |
| 1914 Bandler, Clarence G. | 1925 Bell, Samuel Dennis |
| 1901 Bandler, Samuel W. | 1918 Beller, Abraham J. |
| 1908 Bang, Richard T. | 1930 Bendove, Raphael A. |
| 1924 Banowitch, Morris M. | 1928 Benson, Reuel A. |
| 1926 Barach, Alvan LeRoy | 1926 Benton, Nelson K. |
| 1914 Barber, W. Howard | 1916 Berens, Conrad |
| 1929 Barkhorn, Henry | 1900 Berg, Albert A. |
| Charles | 1927 Berg, Benjamin N. |
| 1930 Barnard, Margaret | 1890 Berg, Henry W. |
| Witter | 1923 Bergamini, Herbert |
| 1930 Barnes, William J. | M. |
| 1908 Barringer, Benjamin | 1928 Berkowitz, Bernard B |
| S. | 1926 Berliner, Milton L. |
| 1908 Barringer, Emily | 1928 Bernheim, Alice R. |
| Dunning | 1924 Bernstein, Max |
| 1924 Barrows, David Nye | 1925 Berry, Frank B. |
| 1913 Barshell, Samuel | 1901 Bierhoff, Frederic |
| 1930 Barthel, Else Anna | 1931 Bierman, William |
| 1909 Bartlett, Frederic H. | 1895 Biggs, George P. |
| 1899 Baruch, Herman B. | 1928 Biloon, Sol |
| 1913 Bass, Murray H. | 1928 Binger, Carl A. L. |
| 1908 Bassler, Anthony | 1920 Bingham, Anne Tefft |
| 1914 Bastedo, Walter A. | 1928 Binkley, George E. |
| 1919 Bauman, Louis | 1927 Bishop, F. Warner |
| 1920 Beach, Bennett S. | 1893 Bishop, Louis F. |
| 1918 Bebb, Rose Anne | 1930 Bishop, Philip George |
| 1912 Bechet, Paul E. | Crosbie |
| 1921 Beck, Alfred Charles | 1928 Bishop, William H. |
| 1914 Beck, August Leo | 1903 Bissell, Dougal |
| 1927 Beck, David | 1915 Black, Florence A. |
| 1911 Beekman, Fenwick | 1910 Blackwell, Hugh B. |
| 1905 Beer, Edwin | 1910 Blank, Marcus I. |
| 1906 Begg, Colin L. | 1919 Blatteis, Simon R. |
| 1905 Beling, Christopher C. | 1896 Blodgett, Frank J. |
| 1923 Bell, Alfred Lee | 1927 Bloom, David |
| Loomis | 1899 Bloom, Selina |
| *1928 Bell, F. McKelvey | 1916 Blum, Theodor |

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| 1927 Blumenthal, J. Leon | 1895 Brien, William M. |
| 1913 Blumgart, Leonard | 1930 Brighton, George |
| 1916 Blumgarten, Aaron S. | Renfrew |
| 1921 Boas, Ernst P. | 1912 Brill, Abraham A. |
| 1918 Bodenheimer, Milton | 1926 Broadwin, Isra T. |
| 1924 Boehm, Joseph L. | 1927 Brock, Samuel |
| 1926 Boenke, Rudolph | *1914 Broder, Charles B. |
| 1926 Boese, William H. | 1904 Brodhead, George L. |
| 1917 Boettiger, Carl | 1904 Brooks, Harlow |
| 1925 Bohrer, John V. | 1922 Brown, Aaron |
| 1884 Boldt, Hermann J. | 1912 Brown, Ethel Doty |
| 1916 Bonime, Ellis | 1895 Brown, James Spencer |
| 1907 Bookman, Arthur | 1901 Brown, Samuel A. |
| 1918 Bookman, Milton R. | 1931 Bruce, Gordon M. |
| 1920 Boorstein, Samuel W. | 1918 Bruder, Joseph |
| 1885 Booth, J. Arthur | 1920 Brundage, Walter H. |
| 1927 Boots, Ralph H. | 1904 Bryan, William |
| 1916 Bortone, Frank | 1929 Buckley, Robert |
| 1915 Bowers, Wesley C. | 1910 Buckmaster, Clarence |
| 1916 Boyd, Carlisle S. | W. |
| 1925 Boynton, Perry S. | 1931 Buckstein, Jacob |
| 1907 Bradford, Stella S. | 1909 Buerger, Leo |
| 1931 Bradner, Renfrew | 1910 Bugbee, Henry G. |
| 1914 Bradshaw, William M. | 1927 Bull, David C. |
| 1918 Brandaleone, Joseph | 1928 Bullard, Edward A. |
| 1931 Brandon, William R. | 1907 Bullova, Jesse G. M. |
| 1929 Brandt, Murray | 1931 Bullwinkel, Henry G. |
| Lampel | 1927 Bunzel, E. Everett |
| 1888 Brannan, John W. | 1926 Burbank, Reginald |
| 1908 Braun, Alfred | 1887 Burch, T. Hamilton |
| 1930 Breidenbach, Lester | 1930 Burchell, Samuel C. |
| 1917 Brennan, Robert E. | 1910 Burdick, Carl G. |
| 1930 Brennan, Thomas M. | 1915 Burk, Samuel B. |
| 1918 Brenner, Edward C. | 1886 Burke, Martin |
| 1924 Brennglass, Joachim | *1906 Burnham, Herbert D. |
| 1897 Brettauer, Joseph | 1908 Burrows, Waters F. |
| 1889 Brewer, George E. | 1886 Burt, Stephen Smith |
| 1930 Brickner, Richard M. | 1911 Busby, Archibald H. |
| 1927 Bridges, Milton A. | 1917 Butler, Eustace C. |

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| 1920 Butterfield, Paul M. | *1929 Chamberlin, Carlross |
| 1928 Buvinger, Charles W. | James |
| 1905 Byard, Dever S. | 1931 Chaney, L. Beverley |
| 1929 Byrd, Charles Wise | 1886 Chapin, Henry D. |
| 1914 Byrne, Joseph | 1920 Chaplin, Hugh |
| 1891 Cabot, John | 1904 Chard, Marie Louise |
| 1927 Caffey, John P. | 1914 Chargin, Louis |
| 1922 Cahill, George F. | 1924 Charlton, Herbert |
| 1885 Caillé, Augustus | Richard |
| 1918 Caldwell, William E. | 1922 Chase, Herbert C. |
| 1920 Calhoun, William C. | 1915 Cherry, Thomas H. |
| 1888 Callan, Peter A. | 1896 Chetwood, Charles H. |
| 1914 Callison, James G. | 1926 Chickering, Henry T. |
| 1898 Camac, Charles N. B. | 1924 Chilian, Stephen A. |
| 1922 Campbell, Ernest A. | 1901 Cilley, Arthur H. |
| 1928 Campbell, Meredith F. | 1904 Clark, J. Bayard |
| 1924 Cannon, A. Benson | 1896 Clark, L. Pierce |
| 1928 Carleton, Sprague | 1922 Clark, Raymond |
| 1921 Carlisle, John H. | 1879 Cleveland, Clement |
| 1902 Carlisle, Robert J. | 1922 Cleveland, Mather |
| 1921 Carlucci, Gaston A. | 1911 Clock, Ralph O. |
| 1922 Carp, Louis | 1894 Coakley, Cornelius G. |
| 1921 Carr, Frank C. | 1931 Coburn, Alvin F. |
| 1886 Carr, Walter Lester | 1917 Coca, Arthur F. |
| 1928 Carrel, Alexis | 1892 Coffin, Lewis A. |
| 1925 Carter, Rupert F. | 1927 Cohen, Frances |
| 1904 Carter, William W. | 1924 Cohen, Harry |
| 1931 Carty, John Russell | 1921 Cohen, Ira |
| 1920 Casamajor, Louis | *1919 Cohen, J. Bernard |
| 1915 Cash, Stanmore L. | 1905 Cohen, Martin |
| 1931 Cashman, George A. | 1928 Cohen, Sam'l A. |
| 1906 Cassebeer, Henry A. | 1910 Cohn, Alfred E. |
| 1905 Cassell, James W. | 1890 Cohn, Felix |
| 1910 Caturani, Michele G. | 1926 Cohn, Sidney |
| 1921 Cave, Henry W. | *1891 Cole, Carter S. |
| 1910 Cecil, Russell L. | 1910 Cole, Lewis Gregory |
| 1908 Chace, Arthur F. | 1909 Cole, Rufus I. |
| 1920 Chalmers, Thomas C. | 1915 Coleman, Joseph |
| | 1904 Coleman, Warren |

1928 Coler, Eugene S.	1900 Crispin, Antonio M.
1925 Coley, Bradley L.	1912 Crohn, Burrill B.
1892 Coley, William B.	1921 Cross, Frank B.
1910 Colie, Edward M., Jr.	1927 Crossman, Lyman Weeks
1925 Collings, Clyde W.	1926 Crump, Armistead C.
1905 Collins, Charles F.	1922 Cudmore, John H.
1898 Collins, Howard D.	1901 Culbert, William L.
1892 Collins, Joseph	1927 Cumbler, George W.
1927 Colonna, Paul C.	1921 Cunningham, W. F.
1922 Colp, Ralph	1915 Curtin, Thomas H.
1927 Combes, Frank C., Jr.	1923 Cussler, Edward
1900 Conner, Lewis A.	1904 Cutler, Colman W.
1927 Connery, Joseph E.	1923 Cutler, Condict W., Jr.
1905 Connors, John F.	1923 D'Albora, John B.
1908 Cooke, Robert A.	1931 D'Alton, Clarence J.
1927 Cooney, John D.	1886 Dana, Charles L.
1922 Coonley, Frederick	1922 Dannreuther, Walter T.
1930 Cooper, Henry S. F.	1922 Danzer, Charles S.
1927 Cornell, Nelson W.	1931 Danzis, Max
1927 Cornell, Van Alstyne	1928 Darlington, Charles G.
1923 Cornwall, Leon H.	1904 Darlington, Thomas
1910 Corscaden, James A.	1908 Darrach, William
1898 Corwin, Theodore W.	1931 Davidoff, Leo M.
1921 Coryell, Clarence C.	1926 Davidson, Leonard T.
1929 Coryllos, Pol. N.	1924 Davidson, Louis R.
1928 Cosgrove, Samuel A.	1931 Davidson, Morris
1926 Coughlan, James F.	1899 Davis, A. Edward
1922 Courten, Henry C.	1909 Davis, George E.
1925 Cowett, Max P.	1920 Davis, Thomas K.
1924 Cowles, Henry Clay	1930 Davis, T. Wallis
1931 Cracovaner, Arthur J.	1930 Davison, Charles
1922 Craig, C. Burns	1922 Dean, Archie L., Jr.
1927 Craig, Howard Reid	1928 De Bellis, Hannibal
1924 Craig, Stuart L.	1920 Decker, John J.
1908 Cramp, Walter C.	1904 de Forest, Henry P.
1921 Crampton, C. Ward	
1926 Crane, Claude G.	
1925 Craver, Lloyd F.	
1910 Crigler, Lewis W.	

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| 1924 deGraffenried, Anthony F. | 1885 Dold, William E. |
| 1928 de La Chapelle, Clarence E. | 1921 Donaldson, Blake F. |
| 1929 Delatour, Beeckman J. | 1930 Donehue, Francis McG. |
| 1880 Delavan, D. Bryson | 1924 Donnet, John V. |
| 1890 Dench, Edward B. | 1928 Donovan, Daniel J. |
| 1908 Denenholz, Aaron | 1927 Donovan, Edward J. |
| 1902 Denig, Rudolf | 1920 Doran, William T. |
| 1927 Dennen, Edward H. | 1888 Dorning, John |
| 1908 Dennett, Roger H. | 1928 D'Oronzio, Joseph B. |
| 1879 Dennis, Frederic S. | 1891 Doty, Alvah H. |
| 1916 Denno, Willard J. | 1904 Dougherty, Daniel S. |
| 1916 Denzer, Bernard S. | 1905 Douglas, John |
| 1931 Depping, Charles W. | 1894 Douglass, H. Beaman |
| 1922 DeSanctis, Adolph George G. | 1923 Dourmashkin, Ralph L. |
| 1915 DeSanctis, Nicholas M. | 1900 Dow, Edmund LeRoy |
| 1917 Detwiller, Albert K. | 1923 Dowd, H. Laurence |
| *1918 DeVecchi, Paolo | 1905 Downey, Martin |
| 1926 Devlin, Joseph A. | 1912 Drake, Bertram F. |
| 1921 deYoanna, Gaetano | 1911 Draper, George |
| 1918 Diamond, Joseph S. | *1904 Draper, John W. |
| 1891 Dickinson, Robert L. | 1927 Driscoll, Wm. Phelan |
| 1915 Dieffenbach, Richard H. | 1910 Du Bois, Eugene F. |
| 1890 Dillingham, Frederic H. | 1911 Du Bois, Francis E. |
| 1924 Dineen, Paul A. | 1919 Du Bois, Phebe Lott |
| 1917 Diner, Jacob | 1926 Du Bois, Robert O. |
| 1922 di Palma, Salvatore | 1917 Dudley, Guilford S. |
| 1906 Ditman, Norman E. | 1899 Duel, Arthur B. |
| 1906 Dixon, George S. | 1928 Duff, John |
| 1929 Dochez, Alphonse Raymond | 1927 Duffy, James J. |
| 1922 Dodd, Raymond C. | 1893 Dunham, Theodore |
| 1927 Doherty, Wm. Brown | 1915 Dunning, Henry Sage |
| | 1916 Dunning, William M. |
| | 1921 Dunnington, John H. |
| | 1916 Durkee, John W. |
| | 1923 Dwight, Kirby |
| | 1913 Dwyer, James G. |
| | 1927 Dwyer, William A. |

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| 1898 Eagleton, Wells P. | 1916 Falk, Henry C. |
| 1927 Eastmond, Charles | 1924 Famulener, Lemuel W. |
| 1926 Easton, Charles D. | 1928 Farnum, Waldo B. |
| 1927 Easton, E. R. | 1909 Farr, Charles E. |
| 1922 Edelman, Leo | 1914 Farrar, Lilian K. P. |
| 1922 Edelman, Moses H. | 1910 Farrell, Benjamin P. |
| 1890 Edgar, J. Clifton | 1910 Faulkner, E. Ross |
| 1903 Edgerton, F. Cruger | 1927 Faulkner, James F. |
| 1921 Edwards, James B. | 1904 Feinberg, Israel L. |
| 1921 Eggers, Carl | 1922 Feinblatt, Henry M. |
| 1915 Eggleston, Cary | 1928 Feit, Hermann |
| 1922 Eggston, Andrew A. | 1923 Felberbaum, David |
| 1931 Eglee, Edward P. | 1930 Felden, Botho F. |
| 1927 Ehrenclou, Cora M. | 1922 Feldman, Samuel |
| 1928 Eidson, Joseph P. | 1922 Felsen, Joseph |
| 1891 Einhorn, Max | 1907 Ferguson, Robert H. |
| 1924 Eisberg, Harry B. | 1891 Ferris, Albert W. |
| 1906 Eisenberg, Isidore C. | 1924 Field, Cyrus W. |
| 1904 Eising, Eugene H. | 1931 Findley, Robert T. |
| 1906 Eliot, Ellsworth, Jr. | 1926 Fineman, Solomon |
| 1925 Eller, Joseph J. | 1922 Finke, George W. |
| 1921 Elliott, Edward S. | 1920 Finkelstein, Harry |
| 1886 Elliott, George R. | 1931 Finkle, Philip |
| 1921 Elmendorf, Ten Eyck | 1913 Finley, Caroline S. |
| 1897 Elsberg, Charles A. | 1929 Fischer, Alfred Elias |
| 1928 Elser, William | 1908 Fischer, Hermann |
| 1894 Ely, Albert H. | 1890 Fischer, Louis |
| 1904 Emerson, Haven | 1928 Fish, George W. |
| 1930 Emerson, Kendall | 1927 Fishberg, Arthur Maurice |
| 1902 Emerson, Linn | 1931 Fishberg, Ella H. |
| 1911 Epstein, Albert A. | 1913 Fishberg, Maurice |
| 1908 Epstein, Sigmund | 1886 Fisher, Edward D. |
| 1910 Erdman, Seward | 1918 Fisher, Judson C. |
| 1892 Erdmann, John F. | 1930 Fisher, Robert C., 2nd |
| 1928 Evans, John N. | *1893 Fisk, Arthur Lyman |
| *1900 Evans, Samuel M. | *1909 Fisk, Eugene L. |
| 1897 Ewing, James | 1924 Fiske, Edwin Rodney |
| 1905 Fahnestock, Ernest | |
| 1931 Falk, Emil A. | |

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| 1895 Fiske, James Porter | 1913 Friesner, Isidore |
| *1896 Fitch, Allen | 1907 Frink, Claude A. |
| 1916 Fitzgerald, Fred J. C. | 1904 Frissell, Lewis F. |
| 1920 Fletcher, Norton | 1919 Froehlich, Eugene |
| DeL. L. | 1930 Frosch, Herman L. |
| 1905 Flexner, Simon | 1896 Frothingham, Richard |
| 1909 Floyd, Rolfe | 1912 Fuchsius, John H. |
| 1922 Fobes, Joseph H. | 1921 Fulkerson, Lynn Lyle |
| 1899 Foote, Edward M. | 1931 Fuller, Clarence C. |
| 1914 Forbes, Henry Hall | 1907 Furniss, Henry Dawson |
| 1904 Ford, William M. | 1931 Gais, Elmer S. |
| 1911 Foster, Nellis B. | 1931 Galdston, Iago |
| 1919 Fowler, Robert H. | 1900 Gant, Samuel G. |
| 1906 Fowler, Russell S. | 1916 Garbat, Abraham L. |
| 1927 Fowlkes, John W. | 1926 Garlock, John H. |
| 1916 Fox, Elsie | 1889 Garmany, Jasper J. |
| 1880 Fox, George H. | 1921 Gatewood, William L. |
| 1904 Fox, Howard | 1914 Gaudiani, Vincent |
| 1906 Frank, Robert T. | 1931 Gavin, Helen |
| 1913 Frankel, Edward, Jr. | 1926 Gay, Frederick P. |
| 1928 Frantz, Angus M. | 1916 Geiringer, David |
| 1928 Frantz, Virginia K. | 1914 Geist, Samuel H. |
| 1920 Fraser, Alexander | 1921 Gelber, Charles N. |
| 1918 Fraser, John F. | 1928 Gerber, Rubin A. |
| 1904 Frauenthal, Herman C. | 1910 Gerster, John C. A. |
| 1923 Freed, Frederick C. | 1929 Geyelin, H. Rawle |
| 1927 Freeland, Frank | 1901 Gibb, W. Travis |
| 1892 Freeman, Rowland G. | 1930 Giblin, John |
| 1931 Freston, Julian M. | 1893 Gibson, Charles L. |
| 1924 Freudenthal, Benjamin | 1894 Gilfillan, W. Whitehead |
| 1927 Freund, Meyer H. | 1906 Gillespie, David H. M. |
| 1926 Frey, Walter G., Jr. | 1921 Gillette, Curtenius |
| 1886 Fridenberg, Albert H. | 1909 Gilmour, Andrew J. |
| 1918 Friedman, Emanuel D. | 1925 Ginsberg, George |
| 1908 Friedman, Louis | 1930 Ginsburg, Solomon |
| 1927 Fries, Margaret E. | 1931 Ginsburg, Sol W. |
| | 1887 Girdner, John H. |

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| 1926 Gitlow, Samuel | 1927 Gordon, Richard E. |
| 1918 Glafke, William H. | 1922 Gottesman, Julius |
| 1922 Glazebrook, Francis H. | 1922 Gottlieb, Charles |
| 1923 Globus, Joseph H. | 1922 Gottlieb, Mark J. |
| 1927 Glushak, Leopold I. | 1915 Gould, Everett W. |
| 1918 Goeller, Charles J. | 1923 Grace, Roderick V. |
| 1928 Goetchius, Harry D. | 1905 Grad, Hermann |
| 1922 Goetsch, Emil | 1908 Graef, Charles |
| 1927 Goff, Byron H. | 1907 Graeser, Herman R. A. |
| 1930 Gold, Harry | 1925 Graham, John C. |
| 1900 Goldan, S. Ormond | 1924 Graham, John R. |
| 1919 Goldberger, Isidore H. | 1910 Grant, John P. |
| 1922 Goldberger, Lewis A. | *1930 Grattan, James Francis |
| 1929 Goldberger, Morris Aaron | 1889 Grauer, Frank |
| 1927 Goldblatt, David | 1909 Grausman, Philip M. |
| 1931 Goldbloom, A. Allen | 1919 Graves, Gaylord W. |
| 1923 Golden, Ross | 1927 Gray, Irving |
| 1891 Goldenberg, Hermann | 1904 Greeff, J. G. William |
| 1928 Goldman, A. Milton | 1905 Green, Nathan W. |
| 1928 Goldman, Charles | 1925 Greenberg, David |
| 1928 Goldring, William | 1928 Greenberger, Monroe E. |
| 1930 Goldstein, Eli | 1913 Greene, James S. |
| 1918 Goldstein, Isidore | 1926 Greene, Marius |
| 1908 Goldwater, Sigismund S. | 1891 Greene, Robert H. |
| 1930 Golub, Jacob Joshua | 1931 Greenhouse, Charles A. |
| 1922 Gonzales, Thomas A. | 1927 Greenwald, Max |
| 1922 Goodfellow, Lillian M. | 1908 Gregory, Alice |
| 1930 Goodfriend, Milton J. | 1908 Gregory, Menas S. |
| 1913 Goodfriend, Nathan | 1895 Griffin, Edwin H. |
| 1906 Goodhart, S. Philip | 1931 Grinnell, Robert S. |
| 1899 Goodman, Abraham L. | 1927 Gross, Louis |
| 1903 Goodman, Charles | 1915 Gross, Maurice H. |
| 1931 Goodman, Henry I. | 1909 Gross, Moritz |
| 1924 Goodman, Herman | 1928 Gross, Paul |
| 1906 Goodridge, Malcolm | 1918 Grossman, Morris |

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| 1928 Grout, Gerald H. | 1912 Hartwell, Henry A. |
| 1918 Grushlaw, Israel | 1901 Hartwell, John A. |
| 1914 Guile, Hubert V. | 1931 Harvey, Harold D. |
| 1909 Guion, Clarence C. | 1897 Harvey, Thomas W. |
| 1927 Guion, Connie M. | 1918 Hasbrouck, James F. |
| 1922 Gulliver, Francis D. | 1925 Haseltine, Sherwin L. |
| 1929 Gutierrez, Robert | 1902 Haskin, William H. |
| 1898 Guttman, John | 1922 Hatcher, Robert A. |
| 1909 Gwathmey, James T. | *1897 Haubold, Herman A. |
| 1901 Haas, Sidney V. | 1928 Hauser, Edwin T. |
| 1909 Haberman, J. Victor | 1927 Hausman, Louis |
| 1927 Hahn, Leo J. | 1923 Hauswirth, Louis |
| 1927 Haiman, Julius Arky | 1895 Hawkes, Forbes |
| 1925 Hajek, Joseph | 1922 Hawkins, William H. |
| 1904 Hale, Henry Ewing | 1921 Hawks, Everett M. |
| 1926 Hall, Fairfax | 1901 Hayes, William Van |
| 1918 Hall, John Mead | V. |
| 1926 Hallett, De Wayne | 1907 Haynes, Royal S. |
| 1919 Hallett, Frederick S. | 1909 Hays, Harold M. |
| 1891 Hallock, Silas F. | 1926 Healey, William V. |
| 1904 Halsey, Robert H. | 1918 Healy, William P. |
| 1921 Halsted, Harbeck | 1895 Heiman, Henry |
| 1916 Hanford, John Munn | 1918 Heine, Joseph |
| 1928 Hanley, James S. | 1890 Heitzmann, Louis |
| 1914 Hansen, Ejnar | 1918 Held, Isidore W. |
| 1928 Hardy, Le Grand H. | 1910 Heller, Isaac M. |
| 1921 Harkavy, Joseph | 1909 Hellman, Alfred M. |
| 1904 Harlow, Ellwood | 1926 Henline, Roy Biggs |
| 1913 Harrar, James A. | 1901 Hennessy, James P. |
| 1909 Harrigan, Anthony H. | 1908 Hensel, Otto |
| 1930 Harrington, Helen | 1927 Herendeen, Ralph E. |
| 1931 Harris, Augustus | 1928 Herman, Harold |
| 1929 Harris, John Huggins | 1910 Herrick, William W. |
| 1921 Harris, Louis I. | 1922 Herriman, Frank R. |
| 1894 Harris, Thomas J. | 1902 Herrman, Charles |
| 1904 Hart, T. Stuart | 1919 Hertz, Julius J. |
| 1911 Hartshorn, Winfred | 1911 Herzig, Arthur J. |
| M. | 1906 Hess, Alfred F. |
| 1917 Hartshorne, Isaac | 1922 Hetrick, Llewellyn E. |

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| 1914 Heyd, Charles Gordon | 1930 Howard, James W. |
| 1931 Heyl, James Harry | 1925 Howard, Robert C. |
| 1899 Hibbs, Russell A. | 1923 Howe, Alexander C. |
| 1922 Higgins, William M. | 1919 Howe, Hubert S. |
| 1910 Highman, Walter J. | 1931 Howell, John Taylor,
Jr. |
| 1903 Hill, Ira L. | 1926 Hoyt, Harold E. |
| 1915 Hill, Miner C. | 1896 Hubbard, William N. |
| 1914 Hillman, Oliver S. | 1901 Hubby, Lester M. |
| 1909 Hinkle, Beatrice M. | 1885 Huber, Francis |
| 1927 Hinsie, Leland E. | 1911 Huber, Frederick W. |
| 1925 Hinton, J. William | 1923 Hnhert, Louis |
| 1913 Hirsch, I. Seth | 1919 Huddleson, James H. |
| 1921 Hirsh, A. Bern | 1919 Huey, Arthur J. |
| 1931 Hirst, Virginius B. | 1928 Hughes, Wendell L. |
| 1904 Hitzrot, James M. | 1910 Huhner, Max |
| 1921 Hoch, George F. | 1928 Hume, Edward H. |
| 1928 Hoenig, Edward | 1927 Humphreys, Frederick
B. |
| 1911 Hognet, Joseph P. | 1916 Humphries, Robert E. |
| 1909 Holden, Frederick C. | 1924 Hunt, Charles Jack |
| 1894 Holden, Ward A. | 1905 Hunt, Edward L. |
| 1920 Holladay, Edwin W. | 1903 Hunt, J. Ramsay |
| 1907 Holland, Arthur L. | 1917 Hunt, Westley M. |
| 1925 Hollander, Edward | 1925 Huppert, Elmer I. |
| 1930 Holt, Evelyn | 1901 Hurd, Lee M. |
| 1930 Homrich, Leslie A. | 1924 Hurd, Ralph A. |
| 1921 Honan, William F. | 1920 Hutchinson, Abbott
T. |
| 1887 Honegger, Oscar P. | 1928 Hutchinson, Robert
H., Jr. |
| 1924 Hooker, Henry L. | 1928 Hutton, Robert L. |
| 1906 Hooker, Ransom S. | 1912 Huvelle, Rene H. |
| 1904 Hopkins, Frank T. | 1918 Hyams, Joseph A. |
| 1926 Hopkins, J. Gardner | 1928 Hyams, Mortimer N. |
| 1928 Horn, Herman | 1882 Hyde, Frederick E. |
| 1901 Horn, John | 1910 Hyman, Abraham |
| 1922 Horn, Walter L. | 1924 Hyman, Harold T. |
| 1913 Horowitz, Philip | 1903 Hymanson, Abraham |
| 1928 Hory, Joseph S. | |
| 1923 Hough, Perry B. | |
| 1913 Houghton, Harris A. | |
| 1930 Howard, Frederick H. | |

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| 1927 Hyslop, George H. | 1918 Johnson, F. Elmer |
| 1894 Ill, Edward J. | 1910 Johnson, Frederic |
| 1900 Illoway, Henry | M., Jr. |
| 1923 Imboden, Harry M. | 1930 Johnson, Scott |
| 1910 Imperatori, Charles J. | 1924 Johnson, Thomas H. |
| 1918 Ingerman, Sergius M. | 1918 Jones, David H. |
| 1908 Ippolito, Gennaro | 1922 Jones, Marvin F. |
| 1924 Irish, William H. | 1930 Jones, Oswald R. |
| 1922 Irving, George R. | 1909 Jonessoff, Emmanuel |
| 1913 Irving, Peter | 1921 Joseph, Morris |
| 1909 Isaacs, Harry E. | 1927 Joughin, James L. |
| 1915 Ives, Robert F. | 1927 Joyner, James C. |
| 1929 Ivimey, Muriel | 1929 Judd, Albert Martin |
| 1908 Jaches, Leopold | 1904 Judd, Aspinwall |
| 1924 Jackson, Elmer C. | 1922 Judd, Harold B. |
| 1928 Jacobi, Harry G. | 1931 Jungeblut, Claus W. |
| 1926 Jacobsohn, Victor J. | 1927 Kahn, Isador W. |
| 1927 Jacoby, Adolph | 1912 Kahn, L. Miller |
| 1885 Jacoby, George W. | 1909 Kaliski, David J. |
| 1904 Jacoby, J. Ralph | 1917 Kantor, John L. |
| 1904 Jaeger, Charles H. | 1926 Kaplan, Ira I. |
| 1910 Jaffin, Abraham E. | 1927 Kardiner, Abraham |
| 1916 James, Henry | 1930 Karelitz, Samuel |
| 1928 James, Wm. L. | 1910 Kast, Ludwig |
| 1930 James, Martin Lewis | 1922 Kaufman, Louis R. |
| 1913 Jarcho, Julius | 1906 Kaufmann, Jacob |
| 1900 Jarecky, Herman | 1928 Keating, John J. H. |
| 1905 Jarvis, Nathan S. | 1909 Keller, Frederick C. |
| 1930 Jasper, M. Newton | 1927 Keller, Henry |
| 1919 Jeck, Howard S. | 1922 Kelley, Catherine |
| 1900 Jelliffe, Smith Ely | Rose |
| 1914 Jellinghaus, C. | 1926 Kelley, Charles B. P. |
| Frederic | 1909 Kellogg, Edward L. |
| 1918 Jenison, Nancy | *1879 Kellogg, Theodore H. |
| 1921 Jennings, John E. | 1929 Kellogg, William A. |
| 1926 Jessup, David S. D. | 1912 Kennedy, Foster |
| 1922 Jessup, Everett C. | 1926 Kennedy, Robert H. |
| 1922 Joachim, Henry | 1927 Kennedy, William T. |
| 1927 Jobling, James W. | 1914 Kent, James M. |

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| 1927 Kenworthy, Marion E. | 1897 Knapp, Arnold H. |
| 1904 Kenyon, James H. | 1922 Knapp, Richard E. |
| 1924 Kenyon, Josephine H. | 1931 Knauth, Marjorie L. |
| 1905 Keppler, Carl R. | 1918 Knight, Frank H. |
| 1899 Kerley, Charles G. | 1907 Knipe, William H. W. |
| 1919 Kerley, James H. | 1897 Knopf, S. Adolphus |
| 1913 Kernan, John D., Jr. | 1921 Knopf, Saul |
| 1901 Kerrison, Philip D. | 1926 Knox, Leila Charlton |
| 1922 Keschner, Moses | *1909 Koch, Louis A. |
| 1909 Kessel, Leo | 1927 Koenig, George A. |
| 1931 Kesten, Beatrice M. | 1931 Koffler, Arnold |
| 1931 Kesten, Homer D. | 1922 Koffler, Emil |
| 1915 Key, Ben Witt | 1924 Kohn, Jerome L. |
| 1898 Keyes, Edward L. | 1927 Kohn, Louis Winfield |
| 1919 Keyes, Harold B. | 1898 Koller, Carl |
| 1912 Kilbane, Edward F. | 1906 Kopetzky, Samuel J. |
| 1895 Kilham, Eleanor B. | 1904 Kosmak, George W. |
| 1931 Kimball, Francis N. | 1911 Kovacs, Richard |
| 1920 Kindred, John J. | 1927 Kraetzer, Arthur F. |
| 1919 King, Edward A. | 1927 Kramer, Benjamin |
| 1915 King, James J. | 1927 Kramer, Rudolph |
| 1920 King, Joseph E. J. | 1920 Kraus, Walter M. |
| 1930 King, S. Edward | 1930 Krech, Shepard |
| 1906 Kingsbury, Jerome | 1923 Krida, Arthur |
| 1922 Kinloch, Robert E. | 1922 Kross, Isidor |
| 1926 Kirby, Daniel Bartholomew | 1917 Krug, Ernest F. |
| 1918 Kirby, George H. | 1926 Kruskal, Isaac David |
| 1922 Kirwin, Thomas J. | 1928 Kuhlmann, Alvin E. |
| 1923 Klaus, Henry | 1927 Kurzrock, Julius |
| 1922 Klein, William | 1928 Kurzrok, Raphael |
| 1914 Kleinberg, Samuel | 1930 Kurzweil, Peritz M. |
| 1930 Kleinfeld, Louis | 1927 Kutil, Henry Robert |
| 1928 Klemperer, Paul | 1930 Kutisker, Meyer J. |
| 1930 Klenke, Dorothy A. | 1926 Ladd, William Sar-
gent |
| 1923 Klepper, Julius I. | 1891 Ladin, Louis J. |
| 1926 Klingenstein, Percy | 1898 LaFetra, Linnaeus E. |
| 1927 Klotz, Walter C. | 1921 Laidlaw, George F. |

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| 1904 Laighton, Florence M. | 1931 Lenz, Maurice |
| 1931 Lally, Jordan | 1914 Leo, Johanna B. |
| 1912 Lamb, Albert R. | 1910 Leopold, Jerome S. |
| 1910 Lambert, Adrian V. S. | 1924 L'Episcopo, Joseph B. |
| 1893 Lambert, Alexander | 1928 Lerner, Charles |
| 1907 Lambert, Frederick E. | 1902 Leshure, John |
| 1930 Lambert, Robert K. | 1916 L'Esperance, Elise S. |
| 1891 Lambert, Samuel W. | 1926 Lester, Charles Wil- |
| *1923 Lampe, Herman F. | lard |
| 1930 Landon, John F. | 1905 Levin, Isaac |
| 1918 Landsman, Arthur A. | 1919 Levin, Oscar L. |
| 1921 Lange, Louis C. | 1931 Levine, Joseph |
| 1922 Langmann, Alfred G. | 1929 Levine, Morris |
| 1918 Langrock, Edwin G. | 1927 Levine, Samuel Z. |
| 1910 Laporte, George L. | 1927 Levy, Ralph J. |
| 1897 Lapowski, Boleslaw | 1922 Levy, Robert L. |
| 1931 La Rotonda, Oswald | 1911 Le Wald, Leon T. |
| 1922 Lasher, Willis W. | 1906 Lewi, Emily |
| 1922 Lattin, Berton | 1927 Lewis, Kenneth M. |
| *1921 Lau, Frederick T. | 1922 Lewis, Raymond W. |
| 1930 Lavalley, Peter | 1897 Lewis, Robert |
| 1920 Lavandera, Miguel | 1908 Lewisohn, Richard |
| 1920 Lavell, Thomas E. | 1918 Lewy, Raphael |
| 1926 La Vigne, Alexander | 1900 Libman, Emanuel |
| A. | 1910 Lieb, Charles C. |
| 1917 Lavinder, Claude H. | 1920 Lieb, Clarence W. |
| 1908 Law, Frederick M. | 1924 Lightstone, Abraham |
| 1927 Laws, Carl Henry | 1927 Likely, David Stanley |
| 1926 Lazarus, Joseph Ar- | 1891 Lilienthal, Howard |
| thur | 1927 Lincoln, Asa Liggett |
| 1921 Leahy, Sylvester R. | 1927 Lincoln, Edith M. |
| 1869 Leale, Charles A. | 1929 Lincoln, James R. |
| 1908 Leale, Medwin | 1918 Lindeman, Howard E. |
| 1921 Lederer, Max | 1917 Linder, William |
| 1897 Lederman, Moses D. | 1926 Lintz, Joseph |
| 1904 Lee, Burton J. | 1930 Lippmann, Robert K. |
| 1928 Lee, George Bolling | 1927 Lipsett, Philip J. |
| 1930 Leff, Morris | 1908 Littell, Elton G. |
| 1928 Lehrman, Philip R. | 1924 Littwin, Charles |

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| 1910 Lloyd, Henry W. | 1895 McAlpin, David H. |
| 1927 Lloyd, Ralph I. | 1916 McAlpin, Kenneth R. |
| *1904 Lobenstine, Ralph W. | 1901 McAuliffe, George B. |
| *1888 Lockwood, George R. | 1928 McAuliffe, Gervais W. |
| 1927 Loeb, Martin J. | 1903 McBarron, John D. |
| 1929 Loeb, Robert F. | 1918 McCabe, John |
| 1930 Loebel, Robert O. | 1909 McCarthy, Joseph F. |
| 1917 Loewenstein, Helene Correll | 1907 McCaskey, Donald |
| 1931 Logie, H. Burton | 1912 McCastline, William H. |
| 1927 Lohman, William H. | 1899 McCoy, John Charles |
| 1931 Loizeaux, Leon S. | 1904 McCoy, John J. |
| 1920 Lombardo, Melchior | 1905 McCreery, Forbes R. |
| 1928 Londrigan, Joseph F. | 1914 McCreery, John A. |
| 1906 Long, Eli | 1929 McDaniel, Floyd C. |
| 1914 Long, William B. | 1921 McDannald, Clyde E. |
| 1919 Lopez, Jose Antonio | 1902 McDonald, Dennis J. |
| 1926 Loré, John Marion | 1930 McDonald, Richard Joseph |
| 1926 Losey, Ray Robinson | 1927 MacFee, William F. |
| 1928 Lough, Walter G. | 1927 McGowan, Frank J., Jr. |
| 1905 Loughran, Robert L. | 1922 McGrath, John F. |
| 1931 Lowrey, Lawson G. | 1903 McGrath, John J. |
| 1916 Lowsley, Oswald S. | 1928 McGraw, Robert B. |
| 1922 Lucus, Thomas D'Arcy | 1931 MacGregor, J. Arnot |
| 1927 Ludlow, George C. | 1929 McGuinness, Madge C. L. |
| 1924 Luippold, Eugene John | 1919 MacGuire, Constantine J., Jr. |
| 1927 Luke, H. Clifton | 1922 MacGuire, Daniel P. |
| 1898 Lusk, William C. | 1897 MacHale, Ferdinand S. |
| 1927 Lutz, J. Raymond | 1920 McHenry, Junius H. |
| 1905 Lyle, Henry H. M. | 1925 McIntosh, Rustin |
| 1908 Lyle, William G. | 1908 MacKee, George M. |
| 1929 Lynch, Jerome M. | 1921 McKendree, Charles A. |
| 1898 Lynch, John B. | |
| 1926 Lyon, Edward C., Jr. | |
| 1930 Lyons, Hubert A. | |
| 1930 Lyons, Morris A. | |
| 1922 Lyttle, John D. | |

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| 1920 McKenna, William F. | 1923 Mann, Hubert |
| *1904 Mackenty, John E. | 1897 Mann, John |
| 1927 MacKenzie, Luther B. | 1927 Mann, Lewis T. |
| 1894 McKernon, James F. | 1904 Mannheimer, George |
| 1927 McKinney, John | 1913 Manning, G. Ran- |
| McDowell | dolph |
| 1931 McLave, Evan W. | 1928 Marcovici, Eugene E. |
| 1928 MacLean, Aubrey B. | 1921 Marine, David |
| 1913 McLean, Stafford | 1913 Marsh, Elias J. |
| 1930 McLean, William | 1928 Martin, Alexander T. |
| 1911 MacLeod, William P. | 1928 Martin, Kirby A. |
| 1920 MacNeal, Ward J. | 1911 Martin, Thomas A. |
| 1917 McNeill, Walter H., | 1906 Martin, Walton |
| Jr. | 1930 Martland, Harrison |
| 1905 MacPhee, John J. | S. |
| 1908 Macpherson, Duncan | 1927 Marton, Louis |
| 1909 McPherson, Ross | 1909 Mason, Howard H. |
| 1928 McQuillan, Arthur S. | 1927 Master, Arthur M. |
| 1924 MacRobert, Russell G. | 1931 Masterson, John J. |
| 1920 McSweeny, Edward | 1904 Mathews, Francis S. |
| S. | 1927 Matsner, Eric M. |
| 1894 Mabbott, J. Milton | 1909 Matthews, Frank C. |
| 1930 Mackie, Thomas Tur- | 1924 Matthews, Frederick |
| lay | J. |
| 1928 Mage, Sigmund | 1928 Matthews, Harvey B. |
| 1923 Magid, Maurice O. | 1886 May, Charles H. |
| 1927 Magida, Nathan | 1907 May, William Ropes |
| 1913 Malcolm, Percy E. D. | 1918 Maybaum, Jacob L. |
| 1905 Mallett, George H. | *1892 Mayer, Emil |
| 1930 Malloch, Archibald | 1918 Mayer, Leo |
| 1920 Maloney, Edward R. | 1905 Meding, Charles B. |
| 1914 Maloney, William J. | 1929 Meek, Raymond E. |
| M. A. | 1916 Meeker, Harold D. |
| 1914 Mandel, Arthur R. | 1922 Meichner, Frederick |
| 1928 Mandelbaum, M. | H., Jr. |
| Joseph | 1900 Meierhof, Edward |
| 1892 Manges, Morris | L. |
| 1925 Manheim, Sigmund | 1927 Meleney, Frank L. |
| 1917 Manley, Herbert D. | 1918 Mencken, Harry P. |

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| 1931 Merrill, E. Forrest | 1918 Moitrier, William, Jr. |
| 1924 Merritt, Katherine K. | 1899 Monaelesser, Adolph |
| 1902 Mersereau, William J. | 1928 Montgomery, Andrew H. |
| 1930 Merwarth, Harold Russell | 1927 Moolten, Ralph R. |
| 1926 Messing, Arnold | 1904 Mooney, Henry W. |
| 1929 Mettenleiter, Michael W. | 1909 Moore, Albertus A. |
| 1885 Meyer, Alfred | 1904 Moorhead, John J. |
| 1925 Meyer, Herbert W. | 1931 Moretsky, Henry M. |
| 1930 Meyer, Monroe A. | 1927 Morhard, Francis L. |
| 1931 Meyer, William Henry | 1922 Morrill, Ashley B. |
| 1887 Meyer, Willy | 1923 Morris, John H. |
| 1921 Meynen, George K. | 1890 Morris, Lewis R. |
| 1907 Michaelis, Alfred | 1891 Morris, Robert T. |
| 1904 Michailovsky, M. | 1927 Morrison, William W. |
| 1912 Michel, Leo L. | 1925 Morrissey, John H. |
| 1918 Milbank, Samuel | 1916 Morrow, Albert S. |
| 1927 Milch, Henry | 1930 Morse, Joseph L. |
| 1906 Miller, Frank E. | 1931 Morse, Russell Wright |
| 1904 Miller, George N. | 1891 Mortimer, W. Golden |
| 1920 Miller, Heymen R. | 1930 Morton, Dudley J. |
| 1904 Miller, James Alexander | 1897 Morton, Henry H. |
| 1927 Miller, John | 1929 Morton, Paul Colhoun |
| 1931 Miller, Laura | 1900 Moschcowitz, Alexis V. |
| 1931 Millet, John A. P. | 1906 Moschcowitz, Eli |
| 1906 Milliken, Seth M. | 1907 Mosenthal, Herman O. |
| 1901 Mills, Jackson M. | 1924 Moss, Abraham |
| 1924 Mills, Nathaniel | 1908 Moss, L. Howard |
| 1919 Miner, Donald | 1913 Mount, Walter B. |
| 1917 Mitchell, Charles R. | 1909 Mulholland, Joseph A. |
| 1925 Mitchell, Wendell | 1918 Munn, Aristine P. |
| 1910 Mittendorf, Alfred D.* | 1882 Munn, John P. |
| 1916 Mixsell, Harold R. | 1892 Munroe, George E. |
| 1926 Moench, Gerard L. | 1927 Murphy, James B. |
| 1922 Moffat, Barclay W. | 1922 Murray, Clay Ray |
| 1913 Moffett, Rudolph D. | 1929 Murray, Foster |

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| 1924 Myers, Florizel deL. | 1910 Ochs, Benjamin F. |
| 1905 Myers, Howard G. | 1930 O'Connor, H. A. D. |
| 1925 Myers, Lotta Wright | 1885 Offenbach, Robert |
| 1926 Myerson, Mervin C. | 1904 Ogilvy, Charles |
| 1889 Myles, Robert C. | 1906 Oppenheimer, Ber- |
| 1928 Nardiello, Vincent A. | nard S. |
| 1929 Nash, Edward M. | 1912 Oppenheimer, Edgar |
| 1903 Nathan, Philip W. | D. |
| 1921 Neal, Josephine B. | 1910 Orgel, David H. |
| 1923 Neer, Edmonde De | 1927 Orgel, Samuel Z. |
| Witt | 1927 Ornstein, George G. |
| 1902 Neer, William | 1928 Orton, Henry B. |
| 1902 Neergaard, Arthur E. | 1904 Osgood, Alfred T. |
| 1928 Neff, Lewis K. | 1908 Osgood, Charles |
| 1927 Neilson, John, Jr. | 1918 Osnato, Michael |
| 1931 Neivert, Harry | 1911 Ottenberg, Reuben |
| 1916 Nelson, Aaron | 1927 Otto, Harold L. |
| 1928 Nelson, Ray S. | 1908 Oulmann, Ludwig |
| 1909 Neuhof, Harold | 1928 Owre, Alfred |
| 1918 Neustaedter, Marcus | 1909 Packard, Maurice |
| 1930 Newman, David A. | 1906 Page, John R. |
| 1908 Newman, Emanuel D. | 1931 Paige, Beryl Holmes |
| 1922 Ney, K. Winfield | 1921 Palefski, Israel O. |
| 1931 Nicholls, Edith E. | 1921 Palmer, Arthur |
| 1908 Niles, Walter L. | 1922 Palmer, Walter W. |
| 1918 Nilsen, Arthur | 1930 Pannell, Walter L. |
| 1917 Nilson, S. John | 1915 Pappenheimer, Alwin |
| 1905 Norrie, Van Horne | M. |
| 1906 Norris, Charles | 1923 Pardee, Harold E. B. |
| 1928 Northcott, Thomas A. | 1923 Pardee, Irving H. |
| 1886 Northrup, William P. | 1892 Park, William H. |
| 1906 Norton, Nathaniel R. | 1906 Parker, Ransom J. |
| 1897 Noyes, William B. | 1906 Parodi, Teofilo |
| 1908 Nutt, John J. | 1908 Parounagian, Mihran |
| 1928 Oast, Samuel P. | B. |
| 1912 Oastler, Frank R. | 1931 Parsons, C. J. F. |
| 1918 Oberndorf, Clarence | 1922 Parsons, William Bar- |
| P. | clay, Jr. |
| 1931 Oberrender, Girard F. | 1911 Pascal, Henry S. |

- 1904 Patterson, Henry S.
 1927 Patterson, Russel H.
 1930 Pattison, Jean Har-
 wood
 1926 Pearlstein, Frank
 1910 Pease, Herbert D.
 1913 Pease, Marshall C.,
 Jr.
 1931 Peck, Samuel M.
 1886 Peckham-Murray,
 Grace
 1898 Pedersen, James
 1904 Pedersen, Victor C.
 1895 Peet, Edward W.
 1923 Peightal, Thomas C.
 1926 Pennoyer, Grant P.
 1928 Perilli, Charles A.
 1928 Perkins, Orman C.
 1929 Perkins, Osborn P.
 1930 Perla, David
 1929 Perlberg, Harry J.
 1917 Perrone, Ettore
 1931 Peters, Frank H.
 1905 Peterson, Edward W.
 1888 Peterson, Frederick
 1921 Philips, Carlin
 1922 Philips, Herman B.
 1886 Phillips, Wendell C.
 1922 Phillips, W. Gray
 1922 Pickhardt, Otto C.
 1928 Pierce, Lee R.
 1923 Pierson, Richard N.
 1904 Pinkham, Edward W.
 1926 Platt, Anna
 1928 Plaut, Alfred
 1911 Plummer, Harry E.
 *1895 Polak, John O.
 1920 Poll, Daniel
 1924 Pollak, Alfred W.
 1891 Pollitzer, Sigmund
 1928 Pomeranz, Maurice
 M.
 1919 Pond, Erasmus A.
 1904 Pool, Eugene H.
 1931 Pope, Edgar M.
 1891 Porter, William H.
 1931 Potter, Howard W.
 1924 Potter, Philip C.
 1913 Pou, Robert E.
 1931 Pound, Robert E.
 1931 Pratt, George K.
 1927 Previtali, Giuseppe
 1931 Prewitt, Proviso V.
 1927 Prime, Frederick
 1907 Proctor, James W.
 1905 Prout, Thomas P.
 1894 Pulley, William J.
 1915 Pumyea, P. Clinton
 1902 Putnam, Charles R. L.
 1926 Putnam, Mary
 1922 Pyle, Edwin
 1920 Pyle, Wallace
 1921 Quick, Douglas A.
 1911 Quimby, A. Judson
 1909 Quinn, Stephen T.
 1891 Quintard, Edward
 1921 Rabinowitz, Meyer A.
 1907 Rae, John B.
 1922 Rafsky, Henry A.
 1927 Rahte, Walter E.
 1929 Raisbeck, Milton J.
 1931 Ralli, Elaine P.
 1918 Ramirez, Maximilian
 A.
 1916 Ramsdell, Edwin G.
 1924 Randall, John A.
 1925 Randel, William A.
 1909 Randolph, John M.

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| 1885 Seaman, Louis L. | 1922 Slattery, George N. |
| 1914 Seff, Isadore | 1923 Smith, Alan DeForest |
| 1922 Selinger, Jerome | 1928 Smith, Beverly C. |
| 1931 Selinsky, Herman | 1917 Smith, Charles A. |
| 1904 Semken, George H. | 1914 Smith, Charles Hen- |
| 1931 Senger, Fedor L. | dee |
| 1911 Senior, Harold D. | 1916 Smith, Clarence H. |
| 1931 Severance, Robert | 1930 Smith, Frank R. |
| 1924 Seymour, Nan Gilbert | 1901 Smith, Harmon |
| 1921 Shailer, Sumner | 1918 Smith, J. Morrissett |
| 1926 Shann, Herman | 1924 Smith, James W. |
| 1908 Shannon, John R. | 1930 Smith, Lawrence Weld |
| 1921 Shapiro, Louis G. | 1919 Smith, Martin DeF. |
| 1926 Shapiro, Louis L. | 1927 Smith, Morley T. |
| 1929 Shapiro, Matthew | 1916 Smith, Morris K. |
| 1926 Sharlit, Herman | 1923 Sneed, William L. |
| 1902 Sharp, J. Clarence | 1918 Snow, William F. |
| 1914 Sharpe, William | 1923 Snyder, Orlow C. |
| 1920 Shattuck, Howard F. | 1913 Snyder, R. Garfield |
| 1905 Shearer, Leander H. | 1904 Solley, Fred P. |
| 1918 Sheehan, J. Eastman | 1927 Solley, Frederick W. |
| 1907 Sheffield, Herman B. | 1905 Solley, John B., Jr. |
| 1905 Shelby, Edmund P. | 1928 Solomon, Harry A. |
| 1931 Sheldon, Paul B. | 1893 Sondern, Frederic E. |
| 1929 Shelley, Harold John | 1925 Sonnenschein, Harry |
| *1909 Shenier, Leo H. | D. |
| 1909 Sherman, Elbert S. | 1910 Soresi, Angelo L. |
| 1920 Sherwin, Carl Paxson | 1902 Sour, Bernard |
| 1910 Shine, Francis W. | 1894 Southworth, Thomas |
| 1918 Shlenker, Milton A. | S. |
| 1931 Shore, Benjamin R. | 1922 Sovak, Francis W. |
| 1928 Shwartzman, Gregory | 1927 Spain, Will Cook |
| 1928 Silbert, Samuel | 1921 Spaulding, Edith |
| 1880 Silver, Henry Mann | Rogers |
| 1893 Silver, Lewis Mann | 1917 Spaulding, Harry |
| 1928 Simons, Irving | Van N. |
| 1921 Siris, Irwin E. | 1928 Speiser, Mortimer D. |
| 1912 Sittenfield, Maurice J. | 1918 Spencer, Henry J. |
| 1921 Skinner, Clarence E. | 1910 Spickers, William |

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| 1920 Spiegel, Leo | 1923 Stillman, Edgar |
| 1923 Spielberg, William | 1918 Stillman, Ernest G. |
| 1922 Spies, Edwin A. | 1911 Stillman, Ralph G. |
| 1927 Spillman, Ramsay | 1931 Stimson, Barbara B. |
| 1901 Squier, J. Bentley | 1921 Stimson, Philip M. |
| 1931 Stainsby, Wendell J. | 1922 Stivelman, Barnet P. |
| 1922 Stark, Jesse B. | 1913 Stockard, Charles R. |
| *1912 Stark, Meyer M. | 1927 Stone, William |
| 1885 Starr, M. Allen | Ridgely |
| 1889 Stearns, Henry S. | 1898 Stone, William S. |
| 1880 Stedman, Thomas L. | 1930 Stoner, William H. |
| 1904 Steese, Edwin S. | 1920 Stookey, Byron P. |
| 1922 Steffen, Walter C. A. | 1924 Stout, Arthur Purdy |
| 1908 Stein, Arthur | 1919 Stowell, David D. |
| 1909 Stein, Sydney A. | 1918 Strachstein, Abraham |
| 1918 Steinach, William | 1904 Strang, Walter W. |
| 1928 Steinbugler, Wm. F.C. | 1908 Strauss, Israel |
| 1925 Steiner, Joseph M. | 1930 Strauss, Spencer Gold- |
| 1928 Stenson, Walter T. | smith |
| 1924 Stephens, Richmond | 1929 Street, Alvin Murray |
| 1925 Stepita, C. Travers | 1928 Strodl, George T. |
| 1905 Stern, Abram Richard | 1917 Strong, Samuel M. |
| 1917 Stern, Adolph | 1887 Stubenbord, William |
| 1908 Stern, Arthur | 1930 Studdiford, William |
| 1928 Stetson, Dudley D. | E., Jr. |
| 1919 Stetson, Rufus E. | 1908 Sturges, Leigh F. |
| 1907 Stetten, De Witt | 1901 Sturmdorf, Arnold |
| 1930 Stevens, Albert M. | 1927 Sturtevant, James M. |
| 1909 Stevens, Alex. Ray- | 1919 Sturtevant, Mills |
| mond | 1912 Sullivan, Raymond P. |
| 1919 Stevens, Charles W. | 1931 Sulzberger, Marion B. |
| 1916 Stevenson, George | 1909 Sutherland, Fred B. |
| 1922 Stevenson, Holland N. | 1927 Sutton, John E., Jr. |
| 1927 Stevenson, Lewis | 1927 Sutton, Lucy Porter |
| 1895 Stewart, George David | 1908 Sweeny, Thompson |
| 1930 Stewart, Harold J. | 1927 Sweet, Joshua E. |
| 1918 Stewart, John D. | 1889 Swift, Edwin E. |
| 1912 Stewart, William H. | 1927 Swift, Harry P. |
| 1911 Stillman, Alfred, 2d. | 1916 Swift, Homer F. |

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| 1928 Swift, Walker E. | 1906 Timme, Walter |
| 1926 Symmers, Douglas | 1906 Titus, Edward C. |
| 1888 Syms, Parker | 1913 Titus, Henry W. |
| 1901 Synnott, Martin J. | 1921 Titus, Norman E. |
| 1904 Taylor, Alfred S. | 1922 Tobin, Thomas J. |
| 1922 Taylor, Charles G. | 1909 Tompkins, Walstein
M. |
| 1921 Taylor, Fenton | 1929 Toole, John |
| 1901 Taylor, Fielding L. | 1891 Torek, Franz J. A. |
| 1927 Taylor, Henry Keller | 1926 Touart, Maximin De
M. |
| 1898 Taylor, Howard C. | 1931 Tonroff, Arthur S. W. |
| 1930 Taylor, Howard C., Jr. | 1895 Tousey, Sinclair |
| 1920 Taylor, Kenneth | 1908 Tovey, David W. |
| 1925 Tenney, Charles F. | 1928 Tow, Abraham |
| 1897 Terriber, Joseph F. | 1902 Townsend, Terry M. |
| 1927 Terry, Arthur H., Jr. | 1902 Tracy, Ira Otis |
| 1918 Terry, Ira B., Jr. | 1925 Traub, Eugene F. |
| 1911 Thacher, Henry C. | 1907 Travell, J. Willard |
| 1910 Theobald, Carl | 1929 Troncoso, Manuel
Uribe |
| 1890 Thomas, Allen M. | 1917 Truesdell, Edward D. |
| 1924 Thomas, Joseph S. | 1927 Tulipan, Louis |
| 1904 Thomas, William S. | 1913 Turck, Fenton B. |
| 1926 Thomasson, Aaron
Hood | 1929 Turner, Joseph |
| 1927 Thommen, August A. | 1906 Turnure, Percy R. |
| 1929 Thompson, Charles
Baker | 1919 Tyson, Cornelius J. |
| 1904 Thompson, Hugh C. | 1890 Tyson, Henry H. |
| 1929 Thompson, Samuel
Alcott | 1917 Unger, Arthur S. |
| *1906 Thomson, Edgar S. | 1924 Unger, James Samuel |
| 1907 Thomson, John J. | 1927 Unger, Lester J. |
| 1927 Thorburn, Grant | 1920 Urquhart, Howard D. |
| 1908 Thorne, Victor C. | 1912 Valentine, Julius J. |
| 1922 Thoruley, Josiah P. | 1910 van Beuren, Frederick
T., Jr. |
| 1916 Throne, Binford | 1906 Van Cott, Joshua M. |
| 1931 Tickle, Thomas G. | 1927 Vander Veer, Albert,
Jr. |
| 1910 Tieck, Gustav J. E. | |
| 1915 Tilney, Frederick | |
| 1901 Tilton, Benjamin T. | |

1924 Van Derwerker, Earl E.	1904 Wallace, George B.
1931 Van Dyck, Laird S.	1904 Wallace, Henry
1922 Van Etten, Nathan B.	1931 Wallace, Robert Pulley
1920 Van Etten, Royal C.	1908 Waller, Newton B.
1927 Van Fleet, J. Flaudreau	1907 Wallhauser, Henry J. F.
1906 Van Ingen, Philip	1904 Walsh, James J.
1906 Van Wagenen, Cornelius D.	1920 Walsh, Robert E.
1908 Vaughan, Harold S.	1891 Walter, Josephine
1926 Verplanck, Van Noyes	1920 Walzer, Abraham
1916 Vietor, John A.	1901 Ward, Freeman F.
1930 Vinciguerra, Michael	1895 Ward, George Gray
1890 Vineberg, Hiram N.	1910 Ward, George H.
1922 Vinton, Cadwallader C.	1908 Ward, Wilbur
1914 Virden, John E.	1901 Ware, Martin W.
1913 Vogel, Karl M.	1914 Warren, Luther F.
1908 Vogeler, William J.	1897 Warsaw, M. Claudius
1903 Voislawsky, Antonie P.	1925 Washburn, Arthur L.
1924 von Deesten, Henry T.	1921 Washton, Jacob
1927 von Glahn, William C.	1928 Watson, Benjamin P.
1929 Von Hofe, Frederick H.	1920 Watson, Cassius H.
1925 Von Sholly, Anna Irene	1921 Webster, David H.
1921 Voorhees, Irving W.	1919 Wechsler, Israel S.
1928 Vorhaus, Martin G.	1928 Weeden, Willis M.
1931 Wachsmann, Siegfried	1928 Weeks, Carnes
1931 Wade, Preston A.	1886 Weeks, John E.
1920 Wadhams, Robert P.	1920 Weeks, Webb W.
1927 Wagner, Lewis C.	1922 Weil, Henry L.
1927 Waldie, Thomas E.	1912 Weinstein, Harris
1928 Waldman, David P.	1927 Weintraub, Sydney
1913 Waldron, Louis V.	1930 Weissberg, Morris
1893 Walker, John B.	1906 Welch, John E.
1903 Wallace, Charlton	1909 Welker, Franklin
	1894 Welt-Kakels, Sara
	1914 Wessler, Harry
	1916 West, Davenport
	1929 West, Randolph

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| 1927 Westermann, John J., Jr. | 1918 Williams, Frankwood E. |
| 1931 Wexler, David | 1916 Williams, Horatio B. |
| 1911 Wheeler, John M. | 1928 Williams, Jesse F. |
| 1928 Wheeler, Wm. L. | 1904 Williams, Linsly R. |
| 1926 Wheelwright, Joseph S. | 1886 Williams, Mark H. |
| 1915 Whipple, Allen O. | 1923 Williams, Percy H. |
| 1927 Whisenant, John R. | 1905 Williams, William R. |
| 1915 Whitbeck, Brainerd H. | 1928 Williamson, Carolyn Gay |
| 1911 White, Francis W. | 1918 Williamson, Hervey C. |
| 1920 White, James W. | 1927 Willis, Benedict P. |
| 1882 White, John Blake | 1931 Wilmoth, Clifford Lee |
| 1920 White, William C. | 1905 Wilner, Anna S. |
| 1906 Whiting, Frederick | 1918 Wilson, Arthur S. |
| 1920 Whitman, Armitage | 1900 Wilson, Frederic N. |
| 1891 Whitman, Royal | 1917 Wilson, May G. |
| 1927 Whittemore, W. Laurence | *1895 Wilson, Norton L. |
| 1904 Wiener, Alfred | *1921 Wilson, William A. |
| 1914 Wiener, Herbert J. | 1914 Wing, Lucius A. |
| 1900 Wiener, Joseph | 1927 Winkelstein, Asher |
| 1883 Wiener, Richard G. | 1909 Wise, Fred |
| 1908 Wiener, Solomon | 1928 Wishner, Joseph G. |
| 1918 Wiggers, August F. A. | 1924 Witt, Dan Hiter |
| *1918 Wight, Jarvis S. | 1927 Woglom, William H. |
| 1905 Wightman, Orrin S. | 1922 Wolf, Charles |
| 1907 Wilcox, Herbert B. | 1922 Wolf, George D. |
| 1927 Wile, Ira S. | 1912 Wolf, Heinrich Franz |
| 1927 Wilens, Ira | 1899 Wolff, Julius |
| 1914 Wilensky, Abraham O. | 1931 Wollner, Anthony |
| 1927 Wilhelm, Seymour F. | 1901 Wollstein, Martha |
| 1922 Willard, Luvia Margaret | 1911 Wood, Francis C. |
| 1893 Willard, Thomas H. | 1931 Wood, Paul M. |
| 1901 Williams, Anna W. | 1924 Wood, Thomas D. |
| 1903 Williams, Charles M. | 1910 Woodruff, I. Ogden |
| | 1917 Woodruff, Stanley R. |
| | 1927 Woodruff, W. Stuart |
| | 1928 Woody, McIver |

1904 Woolley, Scudder J.	1904 Yankauer, Sidney
1891 Woolsey, George	1908 Yeomans, Frank C.
1896 Wootton, Herbert W.	1910 Young, Anna R.
1917 Worcester, James N.	1910 Young, Charles H.
1917 Wright, Arthur M.	1928 Yudkowsky, Peter
1926 Wurtzel, George L.	1908 Zabriskie, Edwin G.
1918 Wyckoff, John H.	1921 Zadek, Isadore
1910 Wyeth, George A.	1930 Zeiss, Robert F.
1889 Wylie, Robert H.	1927 Ziegler, Jerome M.
1924 Wynne, Shirley W.	1909 Zipser, Jacques E.

NON-RESIDENT FELLOWS

1923 Ackerman, James F., Asbury Park, N. J.
1906 Adler, Herman M., Berkeley, Calif.
1903 Adriance, Vanderpoel, Williamstown, Mass.
1931 Ager, Louis C., Rutland Heights, Mass.
1922 Aikman, John, Rochester, N. Y.
1898 Alling, Arthur N., New Haven, Conn.
1888 Armstrong, Samuel T., Katonah, N. Y.
1882 Bacon, Gorham, Yarmouthport, Mass.
1916 Baldwin, Edward R., Saranac Lake, N. Y.
1926 Barker, Creighton, New Haven, Conn.
1906 Barnum, Merritt W., Ossining, N. Y.
1924 Barr, David P., St. Louis, Mo.
1915 Bartholomew, Henry S., Napanoch, Ulster Co., N.Y.
1914 Baughman, William H., Oakland, Calif.
1931 Bedell, Arthur J., Albany, N. Y.
1921 Benson, Arthur W., Troy, N. Y.
1920 Bibby, Henry L., Kingston, N. Y.
1900 Bickham, Warren S., Richmond, Va.
1908 Black, John Fielding, White Plains, N. Y.
1920 Blaisdell, Russell E., Orangeburg, N. Y.
1918 Blake, Eugene M., New Haven, Conn.
1895 Blake, Joseph A., Franklin P. O., Maine
1924 Blancard, William, Roxburg, Conn.
*1924 Blosser, Roy, Providence, R. I.
1908 Blumer, George, New Haven, Conn.
1927 Boltz, Oswald H., Binghamton, N. Y.

- 1919 Bonnell, Clarence H., Rye, N. Y.
- 1930 Booth, Arthur Woodward, Elmira, N. Y.
- 1897 Booth, Burton S., Troy, N. Y.
- 1931 Bourke, Victor G., Livingston Manor, N. Y.
- 1916 Bradbury, Samuel, Philadelphia, Pa.
- 1929 Branham, Vernon, Albany, N. Y.
- 1900 Brooks, Frank T., Litchfield, Conn.
- 1897 Brouner, Walter B., Asbury Park, N. J.
- 1907 Brown, David Chester, Danbury, Conn.
- 1915 Brown, Lawrason, Saranac Lake, N. Y.
- 1922 Brown, Sanger, 2nd, Albany, N. Y.
- 1905 Brownlee, Harris F., Danbury, Conn.
- 1922 Burlingame, C. C., Hartford, Conn.
- 1904 Canfield, R. Bishop, Ann Arbor, Mich.
- 1917 Caples, Byron H., Reno, Nev.
- 1928 Cattell, Henry W., Burlington, N. J.
- 1923 Cavanaugh, Thomas E., Springfield, Mass.
- 1906 Chapman, Charles F., Mt. Kisco, N. Y.
- 1928 Cheever, Austin W., Boston, Mass.
- 1905 Chisholm, William A., Nova Scotia, Canada.
- 1911 Chittenden, Arthur S., Binghamton, N. Y.
- 1925 Christensen, Frederick C., Racine, Wis.
- 1930 Clarke, Thomas Wood, Utica, N. Y.
- 1885 Coe, Henry C., Washington, D. C.
- 1917 Cofer, Leland E., Palm Beach, Fla.
- 1897 Comstock, George F., Saratoga Springs, N. Y.
- 1907 Conaway, Walt P., Atlantic City, N. J.
- 1913 Conley, Walter H., Abroad.
- 1904 Connell, Karl, Winton Lodge Branch, N. Y.
- 1920 Corbusier, Harold D., Plainfield, N. J.
- 1927 Cosgrave, Millicent M. A., Versailles, France.
- 1887 Currier, Charles G., Bernardsville, N. J.
- 1906 Curry, Grove P. M., Mt. Kisco, N. Y.
- 1929 Cutler, Max, Chicago, Ill.
- 1922 Cutter, William D., Chicago, Ill.
- 1913 Davis, Fellowes, Jr., Paris, France.
- 1911 Day, Fessenden L., Bridgeport, Conn.
- 1879 De Garmo, William B., Coral Gables, Fla.
- 1927 De Graff, Arthur C., London, England.

- 1911 Derby, Richard, Oyster Bay, L. I., N. Y.
1904 Divine, Alice, Ellenville, N. Y.
1884 Dixon, George A., Paris, France.
1930 Doan, Charles Austin, Columbus, Ohio.
1895 Dobson, William G., Poughkeepsie, N. Y.
*1889 Dowd, Charles N., Saratoga Springs, N. Y.
1926 Dowling, J. Ivimey, Albany, N. Y.
1924 Dye, John Sinclair, Waterbury, Conn.
1920 Eaton, Henry Douglas, Los Angeles, Calif.
*1899 Elliot, George T., Oxford, Me.
1921 Elwyn, Herman, Chicago, Ill.
1906 Estes, William L., S. Bethlehem, Pa.
1923 Farnell, Frederick J., Providence, R. I.
1885 Farrington, William H., Raubsville, Pa.
1922 Fauntleroy, Archibald M., Ossining, N. Y.
1928 Finch, Lew Henri, Amsterdam, N. Y.
1911 Fitz, George W., Peconic, L. I., N. Y.
1912 Fitzgerald, Clara P., Worcester, Mass.
1894 Flint, Austin, Millbrook, N. Y.
1919 Flynn, Thomas J., Brooklyn, N. Y.
*1929 Fox, George Henry, Binghamton, N. Y.
1913 Garcin, Ramon D., Richmond, Va.
1920 Gardner, Charles W., Bridgeport, Conn.
1922 Garvin, William C., Binghamton, N. Y.
1929 Godfrey, Edward S., Jr., Albany, N. Y.
*1887 Goffe, J. Riddle, Bronxville, N. Y.
1897 Graves, Wm. B., Southport, Conn.
1908 Greenway, James C., New Haven, Conn.
1901 Griffith, Frederic, Philadelphia, Pa.
1927 Haggart, Gilbert E., Boston, Mass.
1896 Hallock, Frank K., Cromwell, Conn.
1920 Hammond, Robert B., White Plains, N. Y.
1919 Hartshorn, Willis E., New Haven, Conn.
1921 Harvey, Samuel Clark, New Haven, Conn.
1897 Haynes, Irving S., Plattsburg, N. Y.
1913 Hebert, Paul Z., Los Angeles, Calif.
1921 Heddens, Vernon O., Pasadena, Calif.
1910 Henderson, Alfred C., Stamford, Conn.
1911 Herring, Robert A., Washington, D. C.

- 1915 Hicks, Horace M., Amsterdam, N. Y.
- 1915 Holding, Arthur F., Albany, N. Y.
- 1927 Holters, Otto R., Asbury Park, N. J.
- 1915 Howland, De Ruyter, Stratford, Conn.
- 1918 Huffman, Otto V., Mt. Kisco, N. Y.
- 1916 Hughes, Frederic J., Plainfield, N. J.
- 1923 Hutchison, Fred R., Huntingdon, Pa.
- 1903 Hyde, Fritz Carleton, Greenwich, Conn.
- 1920 Isham, Mary K., Cincinnati, Ohio.
- 1931 James, Bart Mulford, Bernardsville, N. J.
- 1908 Jameson, James W., Concord, N. H.
- 1912 Jean, George W., Santa Barbara, Calif.
- 1918 Kahn, Morris H., Paris, France.
- 1906 Kann, Ulysses S., Binghamton, N. Y.
- 1925 Kempf, Edward John, Wading River, L. I., N. Y.
- 1927 Klein, Alvin W., Stockbridge, Mass.
- 1922 Klein, Eugene, Tucson, Ariz.
- 1916 Lambert, Robert A., Paris, France.
- 1931 Lane, Clarence Guy, Boston, Mass.
- 1916 Lane, John E., New Haven, Conn.
- 1912 Lathrope, George H., Morristown, N. J.
- 1923 Lawrence, Watson A., White Plains, N. Y.
- 1926 Lawton, Richard John, Terryville, Conn.
- 1896 Leach, Philip, U. S. N.
- 1910 Leake, James Payton, Washington, D. C.
- 1926 Leshin, Hiram R., Port Chester, N. Y.
- 1924 Levinson, Bernard, Freeport, L. I., N. Y.
- 1912 Longcope, Warfield T., Baltimore, Md.
- 1894 Lowe, Russell W., Ridgefield, Conn.
- 1904 Lynch, Robert J., Bridgeport, Conn.
- 1927 MacAusland, W. Russell, Boston, Mass.
- 1909 MacCallum, William G., Baltimore, Md.
- 1924 McCann, William S., Rochester, N. Y.
- 1904 McCullagh, Samuel, Santa Barbara, Cal.
- 1908 McGavock, Edward P., Richmond, Va.
- 1928 McGraw, Arthur B., Grosse Pointe Village, Mich.
- 1920 Mackenzie, George M., Cooperstown, N. Y.
- 1931 McKiernan, Robert L., New Brunswick, N. J.
- 1885 McKim, W. Duncan, Washington, D. C.

- 1910 MacNevin, Malcolm G., San Francisco, Calif.
1920 Maddren, William H., Freeport, L. I., N. Y.
1931 Madill, Grant C., Ogdensburg, N. Y.
1928 Marcoglou, Angelos E., Athens, Greece.
1899 Marvel, Philip I., Atlantic City, N. J.
1884 Mendelson, Walter, Philadelphia, Pa.
1923 Mendez, Albert A., Punta San Juan, Cuba.
1919 Mendillo, Anthony J., New Haven, Conn.
1920 Merriman, M. Heminway, Waterbury, Conn.
1926 Metzger, Jeremiah H., Tyrone, N. M.
1905 Meyer, Adolf, Baltimore, Md.
1907 Mial, L. Le May, Morristown, N. J.
1900 Miles, Henry S., Bridgeport, Conn.
1910 Milne, Lindsay S., Kansas City, Mo.
1912 Morgan, William Gerry, Washington, D. C.
1921 Morrissey, Michael J., Hartford, Conn.
1916 Mott, Walter W., White Plains, N. Y.
1930 Mullins, Samuel F., Danbury, Conn.
1892 Munger, Carl E., Waterbury, Conn.
1910 Murphy, Deas, Litchfield, Conn.
1927 Murray, Henry A., Jr., Boston, Mass.
1916 Neuman, Leo H., Albany, N. Y.
1923 Neumann, Theodore W., Central Valley, N. Y.
1902 Nicoll, Matthias, Jr., Rye, N. Y.
1897 Nisbet, James D., Van Wyck, S. C.
1913 Ober, George E., Bridgeport, Conn.
1930 O'Connor, Francis W., San Juan, Porto Rico
1906 Oertel, Horst, Montreal, Canada.
1910 Oppenheimer, Frederick G., San Antonio, Texas.
1897 Orleman-Robinson, Daisy M., Albany, N. Y.
1927 Overton, Frank, Patchogue, L. I., N. Y.
1919 Painter, Henry McM., Paris, France.
1912 Parker, Edward O., Greenwich, Conn.
1894 Parry, Angenette, Huntington, L. I., N. Y.
1909 Parry, Eleanor, Huntington, L. I., N. Y.
1893 Paton, Stewart, Baltimore, Md.
1920 Patterson, Daniel C., Bridgeport, Conn.
1910 Pearson, Henry, Brownfield, Me.
1919 Pellini, Emil J., Peekskill, N. Y.

- 1923 Penfield, Wilder G., Montreal, Canada.
- 1922 Perkins, C. Winfield, Norwalk, Conn.
- 1924 Phillips, Frank L., New Haven, Conn.
- 1896 Pierson, Samuel, Stamford, Conn.
- 1898 Pilgrim, Charles W., Central Valley, N. Y.
- 1893 Pritchard, William B., Princess Anne, Md.
- 1926 Purdy, Sylvanus, White Plains, N. Y.
- 1889 Quinlan, Francis J., Amawalk, N. Y.
- 1922 Rainey, John J., Troy, N. Y.
- 1919 Raynor, Mortimer W., White Plains, N. Y.
- 1909 Reid, George C., Rome, N. Y.
- 1930 Reifenstein, Edward C., Syracuse, N. Y.
- 1928 Reilly, Thomas F., Springfield, Mass.
- 1916 Reynolds, Harry S., Hartford, Conn.
- 1921 Richardson, Henry B., Darien, Conn.
- 1905 Riggs, Austen Fox, Stockbridge, Mass.
- 1917 Robert, Daniel R., New Lebanon Center, N. Y.
- 1925 Roberts, Edward R., Bridgeport, Conn.
- 1904 Robertson, Joseph A., Dallas, Tex.
- 1901 Robinovitch, Louise G., Golden, Colo.
- 1920 Robinson, Horace Eddy, Pleasantville, N. Y.
- 1924 Rooney, James Francis, Albany, N. Y.
- 1894 Root, Edward K., Hartford, Conn.
- 1931 Ross, William H., Brentwood, L. I., N. Y.
- 1896 Rushmore, Edward C., Tuxedo Park, N. Y.
- 1920 Russell, Thomas Hubbard, New Haven, Conn.
- 1927 Russell, William L., White Plains, N. Y.
- 1913 Russell, Worthington S., Woodbury Falls, Orange
Co., N. Y.
- 1928 Ryder, Morton, Rye, N. Y.
- 1905 Sadlier, James E., Poughkeepsie, N. Y.
- 1907 Sauer, J. George, Passagrille, Fla.
- 1927 Savarese, Melchior F. R., Derby, Conn.
- 1893 Schaufler, William G., Princeton, N. J.
- 1896 Schavoir, Frederick, Stamford, Conn.
- 1922 Schwatt, Herman, Sanatorium, Colo.
- *1884 Scott, George, Atlantic City, N. J.
- 1911 Scruton, William A., Abroad.
- 1925 Seecof, David P., Cleveland, Ohio.

- 1929 Shamaskin, Arnold, Bedford Hills, N. Y.
1904 Sharp, Edward A., Buffalo, N. Y.
1926 Sheahan, William L., New Haven, Conn.
1925 Simpson, Charles A., Washington, D. C.
1915 Slocum, Harry B., Long Branch, N. J.
1909 Smart, Isabelle T., Manasquan, N. J.
1914 Smith, Dorland, Bridgeport, Conn.
1908 Smith, E. Terry, Hartford, Conn.
1927 Smith, Ernest B., Philadelphia, Pa.
1909 Smith, George Milton, Pine Orchard, Conn.
1921 Smith, Scott L., Poughkeepsie, N. Y.
1920 Snyder, William H., Newburgh, N. Y.
1908 Sorapure, Victor E., London, England.
1894 Spence, Daniel B., Morristown, N. J.
1914 Sperry, Frederick N., New Haven, Conn.
1915 Stone, Harry Russell, Clinton, Conn.
1909 Storey, Thomas A., Stanford Univ., Calif.
1912 Stover, Charles, Amsterdam, N. Y.
*1890 Stowell, William L., Bronxville, N. Y.
1907 Stratton, Edward A., Danbury, Conn.
1929 Strauss, Maurice J., New Haven, Conn.
1913 Strobell, Charles W., San Diego, Calif.
1917 Sweet, Charles C., Ossining, N. Y.
1918 Terry, Benjamin T., Rochester, Minn.
1918 Thoms, Herbert, New Haven, Conn.
1911 Tileston, Wilder, New Haven, Conn.
1895 Toms, S. W. Spencer, Nyack, N. Y.
1924 Tooker, Harold Clifton, Springfield, Mass.
1923 Turrell, Guy H., Smithtown Branch, L. I., N. Y.
1916 Vander Bogert, Frank, Schenectady, N. Y.
1902 Van Vranken, Gilbert, Altadena, Calif.
1928 Vessie, Percy R., Greenwich, Conn.
1924 Vier, Henry John, White Plains, N. Y.
1896 Vietor, Agnes C., Boston, Mass.
1905 von Tiling, Johannes H. M. A., Poughkeepsie, N. Y.
1931 Voss, Fred H., Kingston, N. Y.
1907 Wadsworth, Augustus B., Albany, N. Y.
1918 Wahlig, Herman G., Sea Cliff, Nassau Co., N. Y.
1904 Wainwright, Jonathan M., Scranton, Pa.

- 1889 Waldo, Ralph, Westhampton, N. Y.
- 1904 Walker, Emma E., Rockfall, Conn.
- 1910 Wallin, Mathilda K., Elmsford, N. Y.
- 1931 Warner, George H., Bridgeport, Conn.
- 1915 Warner, John W., Washington, D. C.
- 1928 Warshaw, David, Albany, N. Y.
- 1931 Webb, Gerald Bertram, Colorado Springs, Colo.
- 1925 Weigel, Elmer P., Plainfield, N. J.
- 1928 Weil, Arthur, Chicago, Ill.
- 1921 Wertheimer, Herbert G., Pittsburgh, Pa.
- 1922 West, Theodore Stephen, Port Chester, N. Y.
- 1909 White, Davenport, Washington, D. C.
- 1928 White, John F., Port Chester, N. Y.
- *1914 Wilson-Prevost, Charles A., Paris, France.
- 1917 Wise, Lester D., Long Branch, N. J.
- 1905 Wolff, Henry A., Pasadena, Calif.
- 1921 Woodland, Edward E., Brooklyn, N. Y.
- 1926 Wyatt, Bernard L., Tucson, Ariz.
- 1924 Wynkoop, Edward J., Syracuse, N. Y.
- 1923 Yudkin, Arthur M., New Haven, Conn.

ASSOCIATE FELLOWS

- 1928 Achilles, Édith M., New York, N. Y.
- 1928 Armstrong, Clairette P., New York, N. Y.
- 1912 Beard, Stanley Drew, Pearl River, N. Y.
- 1930 Benson, Charles Emile, New York, N. Y.
- 1930 Blanchard, Kenneth C., New York, N. Y.
- 1926 Bodecker, Charles F., New York, N. Y.
- 1930 Bowerman, Walter G., Leonia, N. J.
- 1929 Bryant, Louise Stevens, Bronxville, N. Y.
- 1930 Carr, Malcolm W., New York, N. Y.
- 1928 Chambers, Robert, New York, N. Y.
- 1930 Clarke, H. T., New York, N. Y.
- 1922 Cooke, Elizabeth, Stamford, Conn.
- 1925 Corwin, E. H. L., New York, N. Y.
- 1930 Dakin, Henry D., Scarborough-on-Hudson, N. Y.
- 1910 Davenport, Charles B., Cold Spring Harbor, N. Y.
- 1930 Detwiler, Samuel R., New York, N. Y.
- 1928 Dunning, William B., New York, N. Y.

- 1920 Fine, Morris S., Battle Creek, Mich.
1927 Flinn, Frederick B., New York, N. Y.
1926 Folks, Homer, New York, N. Y.
1927 Franken, Sigmund W. A., New York, N. Y.
1930 Fry, Henry J., New York, N. Y.
1928 Gies, William J., New York, N. Y.
1927 Green, Leo, New York, N. Y.
1914 Greenwald, Isidor, New York, N. Y.
1911 Harris, Isaac F., Tuckahoe, N. Y.
1928 Hartman, Leroy L., New York, N. Y.
1925 Heft, Hattie Louise, New York, N. Y.
1930 Hellman, Milo, New York, N. Y.
1930 Hirschfeld, Isador, New York, N. Y.
1930 Holmes, Joseph L., New York, N. Y.
1930 Hopkins, Harry L., New York, N. Y.
1928 Hoskins, Margaret M., New York, N. Y.
1927 Kingsbury, John A., New York, N. Y.
1930 Kleiner, Israel S., Brooklyn, N. Y.
1928 Kopeloff, Nicholas, New York, N. Y.
1923 Krasnow, Frances, New York, N. Y.
1905 Lee, Frederic S., New York, N. Y.
1921 Little, Clarence C., New York, N. Y.
1904 Lusk, Graham, New York, N. Y.
1928 McCaffrey, Francis S., New York, N. Y.
1931 McFarland, Ross A., New York, N. Y.
1926 Miller, Edgar Grim, Jr., New York, N. Y.
1928 Myers, Chester N., Yonkers, N. Y.
1923 Myers, Victor C., Cleveland, Ohio.
1927 Neuwirth, Isaac, New York, N. Y.
1928 Noback, Gustave J., New York, N. Y.
1927 Oppenheimer, Enid Muriel, New York, N. Y.
1928 Palmer, Bissell B., New York, N. Y.
1927 Paulsen, Alice E., Bronxville, N. Y.
1931 Paynter, Richard H., Brooklyn, N. Y.
1929 Renshaw, Raemer Rex, New York, N. Y.
1927 Scott, Ernest L., New York, N. Y.
1918 Seaman, Emily C., New York, N. Y.
1931 Shuman, Harry Benjamin, Boston, Mass.
1928 Smith, Bertram G., New York, N. Y.

- 1929 Smith, Homer Wm., New York, N. Y.
 1930 Smith, Philip E., New York, N. Y.
 1928 Sobotka, Harry H., New York, N. Y.
 1904 Soper, George A., Great Neck, L. I., N. Y.
 1926 Strong, Oliver Smith, New York, N. Y.
 1930 Sydenstricker, Edgar, New York, N. Y.
 1928 Tallman, Gladys G., New York, N. Y.
 1928 Torrey, Harry Beal, Stanford Univ., Calif.
 1928 Torrey, John C., New York, N. Y.
 1927 Tracy, William D., New York, N. Y.
 1928 von Wedel, Hassow O., Ardsley-on-Hudson, N. Y.
 1927 Waugh, Leuman M., New York, N. Y.
 1927 Weinberger, Bernhard W., New York, N. Y.

*Deceased.

RECAPITULATION

	<i>Number</i>	<i>Vacancies</i>
Resident Fellows	1677	23
Non-Resident Fellows	237	163
Associate Fellows	69	331
Fellows on Exempt List.....	115	
Fellows on Teaching or Research List	65	
Number of Resident Fellows by Borough:		
Manhattan	1420	
Bronx	46	
Brooklyn	70	
Richmond	5	
Queens	19	
Outside of Greater New York....	117	

HONORARY FELLOWS

- Abel, John Jacob, Sc.D., LL.D., Baltimore.
 Archibald, Edward William, M.D. Montreal.
 Barany, Robert, M.D. Upsala, Sweden.
 Bastinelli, Raffaele, M.D. Rome.
 Billings, Frank, M.D. Sc.D., D.S.M. Chicago.
 Bordet, Jules, M.D. Brussels.
 Chagas, Carlos. Rio de Janeiro.

- Cheyne, Sir William Watson, Bt., K.C.M.G., M.B.,
F.R.C.S., LL.D., D.Sc., F.R.S. London.
- Chittenden, Russell Henry, Ph.B., Ph.D., LL.D. New
Haven.
- Curie, Madame Marie Sklodowska, D.Sc. Paris.
- Cushing, Harvey W., M.D., Sc.D., LL.D., F.R.C.S.,
D.S.M. Boston.
- de Schweinitz, George E., M.D., LL.D. Philadelphia.
- Dock, George, M.D., Sc.D. Pasadena.
- Farrand, Livingston, M.D., LL.D. Ithaca.
- Finney, John M. T., M.D., F.R.C.S., D.S.M. Baltimore.
- Fournier, Alfred, M.D. Paris.
- Head, Sir Henry, M.D., F.R.C.P., LL.D., F.R.S. London.
- Hopkins, Sir Frederick Gowland, M.B., D.Sc., LL.D.,
F.R.C.P., F.R.S. Cambridge.
- Jackson, Chevalier, M.D. Philadelphia.
- Jadassohn, Josef, M.D. Breslau.
- Keen, William Williams, M.D., LL.D., F.R.C.S. Phila-
delphia.
- Kitasato, S., M.D. Tokio.
- Leriche, René, M.D., D.Sc. Strasbourg.
- Lewis, Sir Thomas, C.B.E., M.D., F.R.C.P., D.Sc., F.R.S.
London.
- Marie, Pierre, MD. Paris.
- Martin, Sir Charles James, C.M.G., M.B., D.Sc., LL.D.,
F.R.S. London.
- Matas, Rudolph, M.D., LL.D., F.A.C.S. New Orleans.
- Moynihhan, Rt. Hon. Lord Berkeley, K.C.M.G., C.B.,
LL.D., M.S., F.R.C.S. Leeds.
- Neufeld, Friedrich, M.D. Berlin.
- Newman, Sir George, K.C.B., M.D., D.C.L., LL.D.
London.
- Pavlov, Ivan Petrovic, M.D. Leningrad.
- Putti, Vittorio, M.D. Bologna.
- Ramón y Cajal, Santiago, M.D. Madrid.
- Roux, Emile, M.D. Paris.
- Sherrington, Sir Charles S., O.M., G.B.E., M.D., LL.D.,
F.R.S. Oxford.
- Smith, Theobald, M.D., Sc.D. Princeton.

Thayer, William Sydney, M.D., LL.D., D.S.M. Baltimore.

von Müller, Friedrich, M.D. Munich.

Welch, William Henry, A.B., M.D., LL.D. Baltimore.

BENEFACTORS

*Agnew, Cornelius Rea, M.D., New York. *Herrick, Everett, M.D., New York.

*Baker, George F., New York. *Hosack, Alexander E., M.D., New York.

*Brown, James M., New York. *Hosack, Mrs. Celine B., New York.

*Bruce, Frederick T. *Inslee, S., New York.

*Cleveland, Hon. Grover, Princeton, N. J. *Jacobi, Abraham, M.D., New York.

*Curtis, Henry Holbrook, M.D., New York. *James, D. Willis, New York.

*Cushman, James S., M.D., New York. *James, Walter B., M.D., New York.

*Dodge, William E., New York. Jenkins, Mrs. Helen Hartley, New York.

*Draper, William Henry, M.D., New York. *Kennedy, John S., New York.

*Dubois, Abram, M.D., New York. Ladd, Mrs. Kate Macy, New York.

*Farnham, Horace Putnam, M.D., New York. *Loomis, Alfred Lee, M.D., New York.

Farnham, Mrs. Eliza C., New York. *Meyer, Jacob, New York.

*Flower, Hon. Roswell P., New York. *Mills, D. Ogden, New York.

*Ford, James B., New York. *Morgan, J. Pierpont, New York.

*Fowler, Edward Payson, M.D., New York. *Purple, Edwin Ruthven, New York.

Harkness, Edward S., New York. *Purple, Samuel Smith, M.D., New York.

Harriman, Mrs. E. H., New York.

*Starr, Charles J., New Wilson, Margaret Barclay,
 York. M.D., New York.
 Starr, M. Allen, M.D., *Woerishoffer, Mrs. Anna,
 New York. Vienna.
 Tucker, Carll, New York. *Woerishoffer, Charles F.,
 Tucker, Mrs. Marcia New York.
 Brady, New York. *Wood, William H. S.,
 Vanderbilt, Frederick W., New York.
 New York.

*Deceased.

NOTES

DATES OF ACADEMY MEETINGS

STATED MEETINGS

1st and 3rd Thursdays.

SECTION MEETINGS

Dermatology and Syphilology, 1st Tuesday.

Surgery, 1st Friday.

Neurology and Psychiatry, 2nd Tuesday.

Historical and Cultural Medicine, 2nd Wednesday of November, January,
 March and May.

Pediatrics, 2nd Thursday.

Ophthalmology, 3rd Monday.

Medicine, 3rd Tuesday.

Genito-Urinary Surgery, 3rd Wednesday.

Otolaryngology, 3rd Wednesday.

Orthopedic Surgery, 3rd Friday.

Obstetrics and Gynecology, 4th Tuesday.

TRUSTEES, COUNCIL AND COMMITTEE MEETINGS

Trustees, 4th Wednesday.

Council, 4th Wednesday.

Committee on Admission, 1st Wednesday.

Committee on Library, 2nd Tuesday.

Public Health Relations Committee, Mondays.

Committee on Medical Education, 2nd Thursday.

AFFILIATED SOCIETIES

Harvey Society, 3rd Thursday.

New York Pathological Society, 4th Thursday.

Society for Experimental Biology and Medicine, 3rd Wednesday.

New York Roentgen Society, 3rd Monday.

effects accomplished by local heat and vaccine therapy are due to vasodilatation of nonoccluded collateral vessels which suggests the practicability of sympathectomy. Periarterial sympathectomy has been reported of value in isolated cases, but in experience at The Mayo Clinic it cannot be compared with the effectiveness of sympathetic ganglionectomy and trunk resection since the former procedure only interrupts a limited group of sympathetic fibers, whereas the latter can be made to include all the fibers carrying vasomotor responses to the arteries of the extremity.

In the carefully controlled series of 240 cases, traced over a period of from two to six years, medical treatment was given in 150, and sympathectomy was performed in ninety. Brown and his collaborators have shown repeatedly that preoperative increases in skin temperatures from fever therapy have been reproduced and maintained by ganglionectomy and trunk resection, which proves that vasomotor spasm of the collateral vessels has been removed and that the circulation has been increased.

In reviewing the statistics of cases at The Mayo Clinic it was observed that in 60 per cent of the cases the disease was confined to the lower extremities, but in only 2 per cent was it limited to the upper extremities. In 38 per cent both upper and lower extremities were involved. In 2 per cent massive gangrene was present, in 31 per cent gangrenous digits, in 36 per cent trophic ulcers, in 31 per cent painful or swollen extremities, in 90 per cent intermittent claudication, and in 74 per cent rest pain. It was also observed that when one extremity presented evidence of disease the corresponding extremity either had or would develop occlusive arterial lesions in 98 per cent of cases, and thus bilateral sympathetic ganglionectomy was performed.

The comparative results of treatment revealed that the incidence of amputation without adequate medical treatment was 25 per cent, with medical treatment it was reduced to 14 per cent, and to 5 per cent in cases of sympa-

thectomy. There were three deaths in the medical group and five in the surgical group. Fifty-six per cent of the patients in the medical group were markedly improved, the remainder were subject to active recurrences, whereas 83 per cent of those in the surgical group returned to gainful occupations with a cessation of the process in the less affected extremity. When gangrene of the digits occurred in cases in which sympathectomy was performed, lines of demarcation developed promptly and permitted lower amputations than otherwise would have been possible. In a few cases true neuritis existed which was not relieved by any vasodilatating measure, and section of nerves or chordotomy had to be resorted to.

It has become apparent, therefore, that sympathetic ganglionectomy and trunk resection is a useful procedure in checking or reducing the activity of the disease, and has served as a useful means of permanently increasing the peripheral circulation.



OCCLUSIVE DISEASES OF THE PERIPHERAL ARTERIES*

(ABSTRACT)

GEORGE E. BROWN
Rochester, Minn.

Disorders of the peripheral circulation comprise several well known clinical entities, and a heterogenous group of disturbances which have not yet been dignified by nomenclature. A tentative clinical classification of diseases of the arteries of the extremities divides them into two main groups: (1) organic, and (2) functional or vasomotor.

The usual organic diseases include: (1) arteriosclerosis, with or without thrombosis (diabetic gangrene); (2) thrombo-angiitis obliterans; (3) simple thrombosis or embolism; (4) arteriovenous fistulas; and (5) aneurysms with or without thrombosis.

The recognized functional or vasomotor diseases include: (1) Raynaud's disease, a vasoconstrictor disturbance, and (2) erythromelalgia, a vasodilator disturbance.

With the present state of knowledge about 4 per cent of cases cannot be classified. It has been shown that 46 per cent of occlusive diseases of the peripheral arteries represent arteriosclerotic disease with thrombosis and occlusion, 47 per cent represent thrombo-angiitis obliterans, and 7 per cent include other types of organic diseases such as embolic occlusions of cardiac origin and unknown types of thrombotic disturbances not yet classified. Of the functional disturbances, 38 per cent represent Raynaud's disease, 49 per cent represent other forms of primary and secondary vasospastic disorders, and 13 per cent represent vasodilating disorders, of which 4 per cent can be designated as erythromelalgia. Distinction of the vasomotor

*Delivered October 26, 1931.

and organic diseases is determined largely by the presence or absence of pulsations in the peripheral arteries, the high incidence of organic arterial disease among males as contrasted with high percentage (90) of vasospastic disorders (Raynaud's disease) among females.

Errors in diagnoses of the primary vasomotor and organic occlusive diseases may be decreased by appreciation of the following facts: (1) the initial symptoms in many cases of occlusive diseases are frequently initiated by changes in color of the ischemic type, and (2) gangrene in vasospastic diseases, as Raynaud's disease, is mild, and affects largely the skin.

ARTERIOSCLEROSIS

Arteriosclerosis with occlusion of the peripheral arteries is easily recognized. The symptoms are the result of insufficient arterial blood to the distal parts; reduced temperature of the foot; trophic changes in the nails and skin, and pain or excessive fatigue in the foot and calf with exercise, with relief following rest. This symptom (claudication) is pathognomonic of an insufficient supply of arterial blood for active muscular work; a clinical correlation is observed in coronary sclerosis. Pulsations are usually absent in the arteries below the femoral vessels. If patients are aged more than fifty-five years, with evidence of arteriosclerosis in other areas, and the demonstration of definite grades of calcification of the arteries in the roentgenogram, absence of superficial phlebitis, and absence of occlusion in the arteries of the hand, a diagnosis of arteriosclerosis with thrombosis can be made with a high degree of accuracy. Some difficulty in distinguishing arteriosclerosis from thrombo-angiitis obliterans occurs in the sixth decade of life. Certain cases in this decade represent examples of thrombo-angiitis obliterans with secondary changes of arteriosclerosis. Diabetic gangrene has an arteriosclerotic basis; the process is usually a little more intense, and secondary infections intensify the trophic lesions.

THROMBO-ANGIITIS OBLITERANS

Thrombo-angiitis obliterans is a chronic, relapsing, inflammatory disease of the arteries and veins, causing thrombosis, largely confined to those of the extremities. A preponderant racial incidence is noted among Jews. Statistics at The Mayo Clinic show that 55 per cent of patients are gentiles and 45 per cent are Jews. Authentic instances of the disease have been reported in practically all the Oriental and Occidental races. The sex distribution is unusual; in my experience, about 1 per cent of patients are females. Ninety per cent of the patients are between the ages of thirty and fifty years; the average age is forty-two years. Patients aged seventy-three years have been shown, pathologically, to have the disease.

The etiology of thrombo-angiitis obliterans is as yet unknown. Ergotism, specific infection, or toxic agents, and tobacco have been suggested. Barker's statistics have shown that the excessive use of tobacco is much higher in cases of thrombo-angiitis obliterans than in a control group in which ages are similar. There is some correlation between the severity of the disease and the more excessive use of tobacco. I have observed a series of cases in which the patients did not use tobacco.

Buerger reproduced the lesion in human beings by implantations of segments of diseased veins. Horton reproduced the lesion by the injection of organisms grown from acutely inflamed veins into the walls of the veins in experimental animals and by the implantation of the diseased veins contiguous to the veins of animals, thus proving that what is considered the characteristic pathologic picture of thrombo-angiitis obliterans can be reproduced by implantation of diseased vessels.

The pathologic changes in thrombo-angiitis obliterans have been carefully studied by Buerger, Todyo, Mahorner and others. Inflammation at times acute, but more often subacute, occurs. Leukocytes and lymphocytes infiltrate all coats of the arteries or veins; this is followed by oc-

clusion of the vessels by a soft red thrombus which is finally converted into white, dense tissue. There is perivascular binding of the arteries, veins, and nerves into a firmly adherent cord. Mahorner's studies indicate that active proliferation of the intima precedes the thrombosis.

There are five common clinical types: (1) the compensated type with a long history, in which adequate collateral circulation has developed; mild claudication or fatigue in the muscles of the foot or leg, after exercise, may be the only symptom; (2) the slow progressive type, in which there are periods of arterial closure, symptoms of arterial insufficiency, gradual improvement, and then relapses; (3) the type in which gangrene is limited; this includes dry trophic ulcers of the digits, with or without rest pain, with a tendency to heal and then relapses with slight trauma; (4) the acute progressive type, in which within a few months there is closure of large segments of the arteries, frequently bilateral, rapid progression, with trophic ulcers and frank gangrene and excessive pain, and (5) frank massive gangrene, culminating a previous course in the three preceding types.

The symptoms may be grouped as follows: (1) those due to impairment of the blood supply in the distal parts, coldness of the extremity and restriction of exercise by localized fatigue or pain; this symptom (claudication) is pathognomonic of diminished blood supply; (2) those due to trophic lesions, as dry or moist ulcers of the digits, usually with pain without exercise, rest pain; disturbances in growth of nails, and atrophy of muscles, and (3) those related to ulceration, gangrene, secondary infection in the margin of the nail of a digit, and excessive pain, day and night. In a typical case, the clinical course may extend over three or four years before the gangrenous stage supervenes. In addition to these there may be recurring bouts of superficial phlebitis, and vasospastic color changes in the hands and feet. Involvement of arteries of the upper extremities is found in 40 per cent of cases, in about 10 per

cent of which trophic or gangrenous lesions of the fingers are present.

Treatment may be summarized under the following groupings:

1. Prophylactic measures. This entails the diagnosis of cases in the early stage. The patients with symptoms in the hands or feet should be examined carefully for the presence or absence of pulsations in the usually palpable arteries. If pulsation is absent, and the patient is aged less than fifty-five years, a presumptive diagnosis of thromboangiitis obliterans can be made. At this stage, protective measures are most important. These include avoidance of all trauma, and of excessive cold; great care must be exercised in any surgical handling of the parts, such as trimming of the toe nails, and avoidance of and adequate treatment of trichophytic infection. The patient's cognizance of a diminished blood supply in the extremity is the most effective measure for the prevention of trophic sequelæ.

2. Measures to increase the circulation. Postural exercises as outlined by Buerger are useful in the pretrophic stage. Measures for warming the extremities, which include mild grades of radiant heat by exposing the affected extremities to an environmental temperature of 100 to 120° F., are carried out. Prevention of burning of the devascularized skin is secured by adequate ventilation of the baker. Contrast baths may be used cautiously, with due consideration given to the prevention of maceration of the skin or the production of trichophytosis. Various intravenous injections have been used, such as sodium citrate, and hypertonic salt solution. Foreign proteins for the production of fever have been useful. The efficacy of these measures probably depends on reaction to non-specific protein, with vasodilation of peripheral vessels. I have found the use of triple typhoid vaccine (Lederle) for the production of fever to be the most effective measure. This is practically without danger if patients are of the pre-

arteriosclerotic age. It should not be used in the presence of arteriosclerotic lesions because of the increased tendency to thrombosis. Injections of triple typhoid vaccine, 15,000,000 to 25,000,000 dead bacteria to produce 1 or 2 degrees of fever given every third to fifth day in courses of ten to twelve injections, have been most efficacious. Relief of pain and healing of ulcers have been obtained in 70 per cent of cases at The Mayo Clinic. These medical measures will frequently restore the patient to a fairly normal status, but adequate protection from the effects of further thrombosis in other segments of the vessels is not assured. For this reason, the application of sympathetic ganglionectomy is important in selected cases of thrombo-angiitis obliterans.

In a series of 150 cases in which medical measures were carried out for periods of from one to six years, 15 per cent of the patients subsequently lost a leg. This emphasizes the relapsing nature of the disease.

SELECTION OF CASES FOR OPERATION

The effectiveness of sympathetic ganglionectomy in thrombo-angiitis obliterans rests upon the proper selection of cases. The factors of selection are based on two premises, the demonstration of excessive vasoconstriction in the affected extremity, and appreciation of clinical features such as correct diagnosis, age, and general condition of the patient. If trophic lesions are present, their potentiality for healing should be demonstrated. Quantitative studies of the vasoconstrictor factor can be carried out by utilizing measures which temporarily inhibit vasomotor activity to the extremities. This can be accomplished by fever (Brown), by anesthesia (Morton and Scott, Spurling), by injection of the sympathetic ganglia with novocaine (White), and by increased environmental temperature (Lewis). We have utilized the fever method as follows: The foreign protein (Lederle's triple typhoid vaccine) is injected and the mouth temperature is followed simultaneously every half hour with the temperature of

the affected digits. If it is found that the surface temperature of the affected parts increases two or three times that of the mouth temperature, we are safe in assuming that a high degree of vasoconstrictor activity is present. The increase in surface temperature, when reduced to a common unit of fever, we designate as the vasomotor index. We assume a vasomotor index of at least 2, net increase in surface temperature of at least 4° , or maximal surface temperature level of at least 29° C. as indicative of an abnormal degree of vasoconstrictive activity. In addition to the determination of the vasomotor element, the clinical consideration of the patient is of great importance. The age and occupation, the rapidity of development, the history of relapses, the recurrence of trophic lesions, and the degree of disability must all be considered in the final decision.

The validity of the use of pre-operative vasomotor studies as criteria for operation has been studied in seventy cases of thrombo-angiitis obliterans in which lumbar sympathetic ganglionectomy has been performed. The pre-operative surface temperatures with fever have been correlated with the surface temperature readings made two or three weeks after operation. Correlations were calculated between (1) the vasomotor indexes and the increase of surface temperature attained by operation, (2) the rise of surface temperature with fever and with operation, and (3) the maximal surface temperature attained with fever and the maximal surface temperature attained by operation. The highest correlation was shown to exist with the net increase of temperature with fever and the maximal surface temperature attained by operation, $.587 \pm .064$, a high and significant correlation. The net increase of surface temperature obtained with fever is the most useful index in predicting comparable increases in surface temperature from operation. This pre-operative value should be at least 4° C. This predictable value states the increase in circulation in the extremity but does not give information as to the subsequent course of the disease. Episodes

of phlebitis and arteritis may occur after operation. The threshold of safety for prevention of gangrene is significantly raised by the vasodilation effects of sympathetic ganglionectomy. Clinical criteria are probably of equal importance as vasomotor studies in the pre-operative selection of cases.



HEART FAILURE*

(ABSTRACT)**

ARTHUR M. FISHBERG

Associate Physician, Beth Israel Hospital
New York

The presentation is devoted to data available for clinical differentiation of individual types of circulatory failure. The basis of classification is the nature of the disturbance in the *dynamics* of the circulation. As a preliminary, some of the means by which the heart accommodates itself to increased work are discussed.

DILATATION OF THE HEART

In at least a very high proportion of instances, dilatation of the heart is a useful process, playing a fundamental part in the adaptation of the heart to increased work. The studies of Starling, Frank, Straub and others have shown that when either heightened arterial resistance or greater venous inflow increases the work of the heart, accommodation to the greater load involves increase in diastolic volume. When the initial (diastolic) length of the muscle fiber is increased, more energy is liberated in the succeeding systole. The compensatory significance of dilatation of the appropriate chambers of the heart in arterial hypertension, valvular defects, etc., thus becomes clear. So-called myogenous dilatation (in myocarditis, etc.) is discussed, and it is concluded that in this form there is also a compensatory element.

HYPERTROPHY OF THE HEART

Hypertrophy follows dilatation. The link that connects hypertrophy with antecedent dilatation is not clear, but

*Delivered October 27, 1931.

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the utility of the process is elucidated by the following considerations: Inasmuch as the volume of a sphere is proportional to the cube of the radius, as a sphere increases in size, equal increments in volume correspond to smaller and smaller increases in radius. In other words, the larger a cardiac chamber, the less its radius must be diminished to discharge the same volume of blood. Thus, the fibers of the dilated heart contract a shorter distance in maintaining the same stroke volume than do those of the normal organ. But the force of contraction must be correspondingly greater. Dilatation thus leads to the necessity for a shorter but more powerful contraction of the muscle fibers, and hypertrophy would seem to be the adaptation to these altered conditions. Of course, such a line of thought merely considers the wherefore and not the how of the process by which hypertrophy occurs in the dilated heart.

INCREASE IN RATE

The conditions for tachycardia unfolding a compensatory action are especially favorable in cardiac failure, for the shortening of diastole that accompanies tachycardia is neutralized to a large extent by the increased venous pressure, which accelerates diastolic filling. In auricular fibrillation the loss of the quota due to auricular systole militates against compensation by tachycardia.

Among the factors that may play a part in the pathogenesis of tachycardia in cardiac failure is the Bainbridge reflex, the acceleration in rate due to increased pressure near the mouths of the venae cavae and the auricle. With sharp fall in blood pressure, reflexes originated in the carotid sinus and aorta may also be concerned.

THE CARDINAL CIRCULATORY SYNDROMES

The primary distinction is between circulatory failure of cardiac and of peripheral origin. In the category of cardiac failure, further classification on a dynamic basis is often feasible for the clinician. In certain cases, the

cardiac failure is obviously a result of interference with diastole, either in consequence of mechanical incarceration of the heart or because of undue shortening of diastole in tachycardia. These cases may be termed *diastolic failure*. Far more common is cardiac insufficiency where there is no hindrance to diastolic filling but contractility is inadequate. Such *systolic failure* may be confined to the right or the left ventricle while the other chamber is functionally efficient—right or left ventricular failure. The peripheral insufficiencies are doubtless of variegated nature, but they cannot as yet be clinically differentiated.

The syndromes are considered in the following order:

1. Cardiac insufficiencies.
 - A. Systolic insufficiencies—impaired contractility
 - a. Failure of the left ventricle
 - b. Failure of the right ventricle
 - B. Diastolic insufficiencies—inadequate diastolic filling.
 - a. Mechanical incarceration of the heart
 - b. Abbreviation of diastole by tachycardia
2. Peripheral insufficiencies—deficient venous return to the heart
3. Combinations of the above.

FAILURE OF THE LEFT VENTRICLE

Failure of the left ventricle is seen in arterial hypertension, disease of the aortic valve, sclerosis of the left coronary artery, and mitral disease with predominant regurgitation. In acute glomerulo-nephritis, left ventricular failure is the chief danger in the first days of the disease.

The clinical picture of isolated insufficiency of the left ventricle is characterized by symptoms and signs attributable to increased tension in the pulmonary circuit in the presence of normal pressure in the systemic veins. The dominant symptom is dyspnea; often, there are attacks of

nocturnal cardiac asthma. Despite the presence of arterial hypertension, the pulmonic second sound is apt to be the louder. The liver is not enlarged and there is no edema. The stage of isolated insufficiency of the left ventricle may last for many years. Such patients are not uncommonly thought to suffer from bronchial asthma. While some succumb during the stage of isolated failure of the left ventricle, most ultimately develop right ventricular failure.

The dynamic disturbances and symptomatology of mitral stenosis may closely resemble that of left ventricular failure except that nocturnal cardiac asthma is unusual. Here, the circulatory disturbance is really left auricular failure.

FAILURE OF THE RIGHT VENTRICLE

Right ventricular failure occurs in conditions with increased tension in the pulmonary circuit, i. e., mitral disease, emphysema, various forms of pulmonary fibrosis, kyphoscoliosis, extensive pleural adhesions, the rare forms of disease of the pulmonary artery described by Ayerza, etc. Unusual causes are organic changes in the pulmonary and tricuspid valves and disease of the right coronary artery. The superimposition of right ventricular failure on that of the left ventricle was mentioned above.

Failure of the right ventricle is documented by increase in pressure in the systemic veins and swelling of the liver. Cardiac edema is another prime symptom. Cyanosis and dyspnea are almost always present, but in contradistinction to left ventricular failure, the cyanosis is relatively more intense than the dyspnea. The causes of this phenomenon are discussed. Somnolence may be a prominent symptom in severe cases. The great clinical importance of measurement of venous pressure is emphasized. Libman's syndrome of acute occlusion of the right coronary artery—rapid, intense engorgement of the liver combined with sino-auricular block—is mentioned.

CARDIAC FAILURE DUE TO INADEQUATE DIASTOLIC FILLING

Two types of cardiac failure due to inadequate diastolic filling are discussed: 1. Mechanical limitation of diastole due to pericardial effusion or adhesive mediastino-pericarditis with shrinking; and 2. Shortening of diastole in excessive tachycardia.

CIRCULATORY FAILURE OF PERIPHERAL ORIGIN

The peripheral failures are due to stagnation of blood in the periphery of the circulation so that the venous return to the heart is diminished. An important feature for the differentiation from failure of the right heart is the low venous pressure in the peripheral failures. Peripheral circulatory failures occur in surgical and traumatic shock, many of the acute fevers, and diabetic acidosis, to mention only the most common.

The circulatory disturbance resulting from diminished venous return to the heart is one for which the heart cannot compensate. The reason for this is that filling is an entirely passive process on the part of the heart, which functions solely as a force pump; it does not, like a suction pump, aspirate blood from the venae cavae.

There are probably various pathogenetically different types of peripheral failure. Among the factors that have been considered as significant in the causation of peripheral failure are diminution in tonus of the small vessels with resultant increased capacity, defective function of the mechanisms participating in the return of blood to the heart (Henderson's venopressor mechanism), and diminution in circulating blood volume.

The importance of peripheral failure in the clinical picture of coronary thrombosis is discussed. In such cases, the venous pressure is often low, testifying to the peripheral pooling of the blood, which serves to protect the acutely damaged heart.

CUTANEOUS MANIFESTATIONS OF SYSTEMIC DISEASES*

UDO J. WILE

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More than a half a century has elapsed since cutaneous medicine became established as a recognized special field. The development of specialties in general has come about rather slowly, receiving initiative from the great epochs of modern medical science, notably the rational pathology of the Virchow school and the application to the theory and practice of medicine of the principles of modern bacteriology and immunity.

Dermatology may be said in some respects to have had an unfortunate and precipitous birth. It did not develop gradually but was rather abruptly established as a result of the classification of dermatoses based upon pure morphologic characteristics by the early founders of the Vienna school. This has resulted in the development of a cumbersome, awkward, and somewhat irrational nomenclature.

The early interpretation of pure morphologic pictures as these occur in the skin, led away from, rather than toward the concept of general morbid processes. The natural result of this schism from the domain of general medicine was the development of a field with its own peculiar pathology, and with an ever widening breach between its confines and the pathologic processes which affect other systems.

A science based upon such superficial characteristics could not long endure as such. The last two decades, therefore, have seen a great change in the interpretation of disease processes in the skin. The recognition of the integument as an organ of fundamental importance in the

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general physiology of the body, its function as a vast heat-regulating mechanism, as an excretory and secretory organ, and more latterly its recognition in the important biophysical and biochemical activities of the organism, are rapidly aligning disease conditions in the skin to the general pathologic state of the individual. Each year sees more and more so-called essential dermatoses proved and accepted as the cutaneous reflections of systemic morbid processes.

Cutaneous medicine therefore concerns itself with the concept of the skin and its appendages as a complex organ which graphically reflects systemic disease processes in a vast variety of what might be termed reactions. Conversely, it also serves as an excellent yardstick whereby may be evaluated and measured standards of good health.

The so-called essential skin diseases have in the course of the last few years been narrowed down to local infections, both bacterial and mycotic, and to a few benign and malignant growths. The several unexplained inflammatory diseases in the skin such as lichen planus and psoriasis, may in our ignorance still be regarded as peculiar to the integument. The ultimate elucidation of their nature, however, may well show them to be the manifestations of a general rather than a local pathologic condition.

It is manifestly impossible in the allotted time to enumerate or to discuss in detail the various skin manifestations of systemic disease. It would, I think, be far better to emphasize the theme suggested by taking two texts: first, the subject of focal infection in its relation to cutaneous disorders; and, second, the intimate relation of the skin to the group of so-called lymphoblastomatous diseases.

Among the many theories elaborated to explain the phenomena of morbid processes, none has seemed at first glance so attractive, so readily applicable to many diseases as that of bacterial foci from which systemic infections take place. Following, as it did, in logical sequence, the identification of specific microbes as causative agents in the pro-

duction of disease, and the subsequent knowledge of bacterial sepsis, it is readily comprehensible why the theory of focal infection should have been readily applied to hitherto unknown etiological entities.

That focal infection has passed from a scientific theory to a proved principle cannot be gainsaid. The work of Billings, Rosenow, Holman and many others in this country and abroad has established beyond peradventure that its application to certain disease processes fulfills all scientific postulates. However, it must also be admitted that, like uric acid, the theory of focal infection has had woven about its application as much of fiction as of truth.

There is a basic misconception and rather widely current confusion in the minds of many who have written and spoken on this subject, between the terms, focus of infection and focal infection. The two are frequently loosely and synonymously applied in both writing and discussion, when in fact they should be sharply differentiated.

Billings described a focus of infection as a circumscribed area of tissue infected with pathogenic organisms. Holman has pointed out, therefore, that any condition resulting from the systemic dissemination of bacteria from the source or focus becomes a focal infection. It is therefore self-evident that focal infection results from foci of infection and the two terms, although related sequentially, have different identities and must not be confused (and we must at all times distinguish between them).

Perhaps the simplest example of proven focus and consequent focal dissemination is the chancre of syphilis; here we have a nidus of pathogenic organisms leading to more or less rapid dissemination and to remote morbid processes in the skin, viscera and mucous membranes, thus representing admirably a focal infective process.

It seems quite natural that in the ten or more years since Billings' first paper on focal infection the theory should have found favor among dermatologists, and an earnest

effort should have been made to apply it to our many obscure etiological problems.

When the initial wave of enthusiasm passed, it was found as in other advances in medical science, that something new had been added to our knowledge of disease cause, but much was left over to be explained on other theories. It is safe to state that at some time or other almost every etiologically obscure dermatosis has been said to result from a focus of infection, but only a few have stood the rigid scrutiny of scientific accuracy and have been established as of such origin.

With the clear-cut definition of a focus of infection as a nidus of pathogenic organisms, and of focal infection as the expression of systemic invasion by these organisms, very rigid criteria should be applied to a disease, together with convincing experimental evidence, before it may be accepted as an example of a focal infective process.

In by far the majority of examples in cutaneous medicine where focal infection has been suggested as the cause of symptoms, the case has been made on suggestive criteria and on clinical data. Thus, one observer with a series of cases of, let us say, alopecia areata, in which dental caries has co-existed, expressed the opinion that the latter as foci caused the former. His view was perhaps strengthened by the clinical observation that the alopecia disappeared after removal of the alleged foci. I shall hope to show later that while such evidence is perhaps suggestive or presumptive, it lacks scientific accuracy and does not sufficiently support accepted postulates for cause and effect in disease.

At some time or other the following conditions have been considered to be due to foci, and therefore examples of focal infective processes: urticaria, urticaria pigmentosa, eczema, the erythema multiforme group, cutaneous tuberculosis and the tuberculides, hemorrhage, petechiae, purpura hemorrhagica, herpes zoster, pemphigus, derma-

titis herpetiformis, lupus erythematosus, keratosis blenor-rhagica, and many others.

It now appears that in a few cases focal infection adequately explains certain cutaneous diseases in which up to now, to the best of my knowledge, that cause was not suggested for them. Such are the trichophytides, sporotrichosis, tularemia, and probably vaccinia and certain of the contagious exanthems.

It might be well at this time to apply rigid scientific criteria to the above groups, and to see to what extent focal infection is proven in one group, presumptive or likely in a second, and unlikely or improbable in the third.

In the proven group stand out syphilis, sporotrichosis and tularemia with their portals of entry in an injury, cases of systemic blastomycosis, the petechial and hemorrhagic lesions of bacterial sepsis, the trichophytides, scarlet fever, vaccinia, and the many extraordinary mutation forms of skin tuberculosis, including the sarcoid of Boeck, the deep tuberculosis of the hypoderm, and many of the so-called tuberculides.

It may well be argued that systemic or blood-borne tubercle bacilli are difficult to determine, and that with all the evidence not at hand in every case, it would seem improper, for example, to class lupus vulgaris in its many clinical forms, sarcoid tumor, lupus miliaris, and lichen scrofulosorum as examples of tubercle implantation from a remote focus.

Admitting the validity of this argument, it is nevertheless true that the overwhelming preponderance of opinion favors the view that these are endogenous blood- or lymph-borne infections, and the weight of clinical evidence, together with some experimental proof, supports this view.

When we come to the tuberculides, however, we face a group of conditions which in part fit in with the concept of focal infections, and in part do not.

It seems to be accepted that certain tuberculides are actually hematogenous tuberculous lesions. Bacilli have at times, with difficulty to be sure, been demonstrated, or occasionally animal inoculation has shown the lesions to contain bacilli. Others, on the other hand, are widely if not generally accepted as evidence of tissue changes due to tubercle toxin liberated from a tuberculous focus. To include such a group, providing the hypothesis of their nature is correct, in the class of focal infections, would necessitate a wider interpretation of our theory than we postulated at the outset.

In the interest of scientific accuracy, therefore, it would seem wiser to limit the term focal infection to those conditions in which systemic dissemination of pathogenic organisms occurs, and to place the group of toxic tissue reactions from remote foci, in a class which might properly be called, *focal irritative processes*.

Following the researches of Jadassohn, Bloch, and their students, we may now place in the group of proven focal infections the generalized dermatoses due to the hematogenous dissemination of mycelia and spores, originating in such local lesions as the kerion ringworm.

To these lesions the name of trichophytides has been given. The identification of this group and the demonstration of the entity as a systemic infection is a scientific achievement of considerable importance.

The petechial hemorrhages and purpura which are seen in the skin incident to bacterial endocarditis and to general sepsis, also fulfill the postulates of focal infections as do the rose spots of typhoid fever.

Scarlet fever is, of course, as good an example as is syphilis of a focal infection if we accept the throat as the portal of entry of the streptococcus which produces the septic erythema.

The weight of evidence also supports the view of a focal infection for the other contagious exanthems as well.

Until we know more about the smallpox virus and the infectious agents of measles and chickenpox, however, we must place the entire group aside from scarlet fever and vaccinia as presumptive but not yet proven cases.

Sporotrichosis and tularemia are strikingly similar in their mode of onset as starting with lymph-borne infections, which occasionally develop septic manifestations. Both conform admirably to the criteria of focal infective processes.

Yaws in all probability fulfills the conditions of a focal infection, but until its epidemic character and method of transmission are better known, it is best not to include it in the proven focal infectious group at this time.

Although Rosenow has shown bacteria in some of the lesions of erythema multiforme, notably in erythema nodosum, and demonstrated similar strains in the tonsils and elsewhere, I do not believe the evidence at this time is sufficiently convincing to place this very large and varied group of cutaneous reactions with the proved cases of focal infection. The weight of clinical evidence, to be sure in cases such as erythema nodosum in association with rheumatic fever, points to bacterial dissemination. However, it seems quite likely that many forms of erythema multiforme, perhaps the majority, are toxic rather than microbic processes. Many, indeed, very definitely refer back to such causes as foreign protein and drug reactions, thus establishing for them other etiologic factors than infective foci.

While for the entire erythema multiforme group, foci of infection, therefore, as a cause do not fit, in isolated cases we may occasionally be dealing with hematogenous bacterial dissemination.

Toxins rather than infective organisms explain even more readily the urticaria group of dermatoses. These at one time may be due to local toxic irritations and at others to systemic intoxications, as from enteric protein sensi-

zation or from toxins associated with gall bladder and hepatic disease. While frequent clinical evidence supports the view of foci of infection as the cause of urticaria, the local manifestation is never an evidence of systemic sepsis. It is a *focal irritative* rather than a focal infective process.

Herpes zoster is another disease probably definitely specific and due to an infective focus. The remote lesions on the skin, however, can very properly be regarded as focal irritative rather than focal infective sequelæ. The immunity usually conferred by herpes zoster, moreover, does not fit in with the ordinary history of a focal infective condition where recurrence and chronicity are the rule. It stands out, however, as an admirable example of a change in a remote portion of the body dependent upon a focus of irritation.

A disease which may at some time be shown to be a focal infection, in which the evidence thus far is supported only by clinical evidence, is pityriasis rosea. The frequency of an initial plaque in this disease, the sudden explosion of satellite lesions support the view that we are dealing with a systemic dissemination of an infectious agent from a primary plaque. My own experiments with this disease, extending over five years, while inconclusive, strengthen my belief that a specific blood-borne infectious agent is its cause.

Alopecia areata has been supported by many as an example of a focal infective disease. It is certainly true that the removal of carious and abscessed teeth has frequently resulted in the cure of this condition. Likewise, the uncovering of visual difficulties, sinus infection, and other foci of infection or irritation in the head, has resulted in spontaneous cure of the baldness.

There is to my knowledge, however, no direct experimental evidence to show that alopecia areata can, in the strictest sense of the word, be a focal infection. If the vast preponderance of cases cleared up upon removal of infectious foci, which in fact does not occur, the disease

could at most be placed, like herpes zoster, in the group of *focal irritative* processes.

Many of our deductions as to the focal infective character of a disease are based first, upon the establishment of a focus of infection, second upon the disappearance of the general process after the removal of the alleged focus.

Both hypotheses are open to criticism. Most individuals can be shown to have some demonstrable focus of infection in the teeth, tonsils, gall bladder, appendix, prostate, or elsewhere. The finding of a focus is, therefore, only suggestive. Thus, if a tuberculous focus were found in a lymph node or tonsil in the presence of a cutaneous tuberculosis, the case would at once suggest the relationship between the two conditions, which might, however, be difficult of actual proof.

The clearing up of a systemic condition or of a dermatosis upon the removal of a focus of infection, moreover, has importance where bacteriologic proof is lacking, only when it occurs with great regularity, and only when other causes cannot operate to produce the same condition. Under these circumstances, focal infection may be assumed, but its ultimate proof still requires the demonstration of a pathogenic organism in both cause and result.

Where occasional cure of a dermatosis occurs upon removal of a focus, it is more likely that this results from the relief of inhibitory forces which such a focus may exercise on general conditions; or it may be a response to general well being, resulting from the removal of the focus. These factors will explain the cases of lupus erythematosus and of dermatitis herpetiformis, which occasionally clear up rapidly upon removal of infected foci. In both of these conditions the weight of evidence is against their being true focal infective processes.

It may properly be pointed out that occasionally the removal of a focus which, without doubt, is the causative factor of a dermatosis, is not followed by involution or even im-

provement in the focal infection. The demonstration and removal, for example, of a tuberculous lymph gland in the neck would effect little, if any, change in a resulting patch of lupus vulgaris, although it might well be a preventive measure against the development of new lesions. Irreparable tissue damage due to hematogenous germ dissemination cannot be followed by restitutio when the source of the infection is laid bare and removed.

In conclusion, it may be emphasized that foci of infection play either a causal or a casual rôle in the etiology of many dermatoses, or their presence may have nothing whatever to do with the disease in question.

Where the foci are causal, we are dealing with true focal infection as determined by blood-borne dissemination of the pathogenic organism from the focus to the satellite lesion.

This occurs in a proven fashion in syphilis, cutaneous tuberculosis, certain tuberculides, the trichophytides, sporotrichosis, tularemia, systemic blastomycosis, vaccinia, and scarlet fever.

A casual relationship occurs between foci and certain dermatoses with such frequency as to merit notice, and possibly to constitute a contributory etiologic factor in such conditions as erythema multiforme, dermatitis herpetiformis, and alopecia areata.

Finally, to the focal infective process might well be added a group in which foci of infection play a direct rôle in the causation of satellite cutaneous lesions, in which pathogenic organisms are not present, but in which the tissue damage is apparently due to a toxic process. This occurs in herpes zoster, in some of the so-called toxi-tuberculides, in many of the multiforme erythemas, and occasionally in urticaria. This group might properly be referred to as *focal irritative* processes.

During the past twenty years I have had a most unusual opportunity of studying a very large number of cases of

what formerly was termed the lymphadenoses of the skin. In this connection I have been singularly fortunate in the exchange of views with my late colleague Warthin, who throughout his active life contributed much to the pathology of these conditions. In 1929 there were reported from my clinic by Keim twenty cases of various clinical types, of which ten came to autopsy. A great diversity of opinion exists as to the proper classification of diseases of the lymphatic hæmapoietic system. Those which are frequently found in the skin and occasionally occur there before their demonstration in other parts of the body are leukemia, both myeloid and lymphatic, lymphosarcoma, Hodgkin's disease, and granuloma fungoides. From our studies of this group of diseases we have come to the belief that genetically they are closely related, occasionally occurring as combined pictures or changing from one clinical form to another.

From the clinical standpoint the most frequent cutaneous manifestation of the so-called lymphoblastomas occurs as a persistent scaling erythroderma. So frequently is a true lymphadenosis ushered in by a universal scaling dermatitis that the chronicity of this condition should always lead to suspicion of its grave nature. The condition may occur with or without changes in the circulating blood stream. In the majority of cases these are absent at the outset and develop only later in the course of the disease. In a few of our cases marked lymphocytic deviations in the blood occurred only shortly before death. In the large majority of cases a marked lymphadenitis is present, though not usually developing until the disease has been present in the skin for some months. I have, however, seen a few cases in which there was general lymphatic enlargement preceding the development of the erythroderma. Of greatest diagnostic import in determining the lymphoblastomatous nature of an erythroderma is the early biopsy. Even in the very early period the picture is quite characteristic—an infiltrate of lymphoblastic cells occurring in the upper portion of the corium either in clumps or as a

sharp band-like infiltrate quite similar in its architecture to that seen in lichen planus. The biopsy of the lymph glands shows enormous hyperplasia and the same type of lymphoblastic cells as are seen in the skin. In two cases of an unusual type of cutaneous lymphatic leukemia I have seen an ordinary exfoliative dermatitis, unassociated with lymphadenitis and with no unusual blood picture, entirely remit for several months, then reappear with associated lymph gland involvement, and finally remain in a state of chronic cutaneous lymphadenosis with the blood changes of a chronic lymphatic leukemia. In one case of true cutaneous leukemia with marked changes in both the blood and lymph glands, spontaneous recovery took place after four years of observation, during which time the patient on several occasions was considered dangerously ill. Since this observation I have seen spontaneous recovery in a second similar case.

In myeloid leukemia the cutaneous manifestations are considerably more rare. Quite apart from the cutaneous hemorrhages and purpura, one occasionally sees tumors of varying size and density, more particularly occurring on the face. Their appearance on the skin very occasionally antedates or is coincident with the first symptoms which lead to an examination of the blood and the establishment of the diagnosis. The tumors are pure myeloid in structure, and many exist only as transitory cutaneous manifestations of the disease. I have seen one universal type in which large tumors of a purplish-red color appeared all over the body, some of which ulcerated. The resemblance of this type of case to the entity of mycosis fungoides is quite striking.

In Hodgkin's disease one may recognize on the skin the so-called essential types of eruptions. These take the form of definite nodules. The architecture of the latter conforms exactly to that of the pathologic picture seen in the lymph glands. The so-called non-specific lesions occurring in Hodgkin's disease take the form of prurigo-like nodules and excoriations and pigmentation. These are

alleged to be toxic reactions of the disease rather than examples of true cutaneous Hodgkin's disease.

In at least one case, however, in which prurigo-like nodules occurred, I was able to demonstrate very definite pathologic architecture typical of the disease.

The pigmentation seen in Hodgkin's disease is sometimes of a very bizarre nature. I have at present under observation a young man who was admitted for an exfoliative dermatitis which rapidly cleared up on topical remedies. He returned to the hospital less than a month ago with a zone or band of deep brownish pigment extending around the waist and onto the upper portion of the thighs. There was also hyperpigmentation of the axillæ and sufficient thickening of the skin to suggest at least a diagnosis of *acanthosis nigricans*—a pigmentary disorder discovered by your fellow member Pollitzer many years ago and shown by him to be a frequent accompaniment of abdominal neoplasm. In addition to the pigmentation there was marked enlargement of the inguinal and axillary lymph nodes. A biopsy taken from these and from the overlying thickened skin showed typical early Hodgkin's disease.

With regard to lymphosarcoma, the cutaneous manifestations are extremely varied. One may have, as in leukemia, a scaly erythroderma, apparently benign at the outset and leading to the diagnosis of simple exfoliative dermatitis from one cause or another. Subsequently a marked enlargement of the lymph nodes leads to the suspicion of the lymphoblastomatous nature of the eruption, and the biopsy, both skin and lymph node, readily establishes a diagnosis of small or large round-celled sarcoma. In the late stages of this condition actual metastatic nodes to the skin may occur in large numbers in various parts of the body. In other cases lymphosarcomatous nodes may appear in various parts of the otherwise normal appearing skin, to be followed at a later time by the generalized involvement of the lymph nodes. The picture of the erythrodermatous type is therefore indistinguishable clinically from leukemia and from occasional cases of Hodgkin's disease.

I have before referred to the occasional combination pictures which are seen in these various conditions. So closely may they simulate each other that a clinical diagnosis must occasionally be changed from time to time during the course of the disease.

I shall show lantern slides of two cases illustrating this point. In one, definite lymphosarcomatous nodes were removed from the skin of a young boy who at the time showed little or no change in his blood. He later developed severe hemorrhages into the skin, hemorrhages from his mucous membranes, following which he developed a rapidly fulminating type of lymphatic leukemia from which he died. A second case which I still have under observation is that of an elderly man with multiple lymphosarcomatous nodes in the skin and lymph glands in whose blood at this time there are changes suggesting at least leukemia.

Many years ago there was demonstrated before the Dermatological Section of this Academy a patient in whom at the time it was believed both leukemia and granuloma fungoides were present. The case which I cited before of a young boy who died of myeloid leukemia in whose skin a large number of large ulcerative nodules occurred is, I believe, the analogue of this condition.

An interesting question arises in connection with those cases of lymphoblastoma in which a scaly erythroderma of an innocent type antedates the more serious phase of the disease. The suggestion in this type of case is that the cutaneous insult may be a primary factor in the activation of the lymphadenosis. In cases biopsied during the early period there may be no suggestion of a lymphoblastomatous infiltrate. While the majority of the cases are undoubtedly lymphadenoses from the outset, it is nevertheless a tenable hypothesis that in a few cases at least the lymphadenosis may be secondary to a prolonged skin insult. The analogy at least is present as regards occasional infection and acute lymphatic leukemia.

My own studies have convinced me that the lymphadenoses are reflected in the skin in three different ways. First, and perhaps more rarely, one may find in the incidence of lymphadenotic blood pictures the cutaneous expressions as infiltrations and tumors, together with hyperpigmentation. These are true metastatic lesions. Second, one finds pictures in which the cutaneous lymphadenotic infiltrations antedate the chronic involvement of the blood and lymph glands. In this group are found large numbers of cases of exfoliative dermatitis of great chronicity, as well as isolated tumors and infiltrations. The third group includes particularly scaly erythrodermas and occasionally also localized infiltration in which transitory deviations from the normal are found in the blood stream, together with characteristic hyperplastic changes in the lymph nodes. In this group occasional recovery may take place with complete restitutio even after several months or years. In such cases I believe the skin pathology rather than reflecting systemic changes may by cutaneous insult act as a causative factor in the production of secondary lymphadenotic changes which simulate closely the typical primary cases.

The group of lymphoblastomas illustrate admirably the cutaneous manifestations of systemic disease. They represent a very small although important group which serve merely as a text upon which to elaborate the theme you have been good enough to ask me to discuss. One might with equal profit, if the time permitted, discuss the cutaneous manifestations of glycosuria, the unique changes in the skin incident to the disorders of fat metabolism such as occur in xanthoma, the atrophic changes of arteriosclerosis and senility, the remarkable changes in the integument with endocrinous disfunctions, and the subject of the skin as a reflector of emotional states. These and many others, if time permitted, could each be taken as a text to illustrate that, apart from its protective function, its thermostatic control, and its secretory and excretory functions, the skin admirably reflects and intimately takes

part in many, if not most, of the morbid processes of the body.

DISCUSSION

WILLIAM R. WILLIAMS
New York

Doctor Wile's paper is so clear and convincing that there is no place for controversy in a discussion of it.

It is important to define, as he so definitely does, the precise limitations of the terms relating to focal infections. Such distinctions foster more accurate thinking in dealing with the nature and the cause of lesions throughout the body as well as those within the realm of dermatology.

The changed point of view of dermatologists that tends to a broader outlook upon skin conditions and that links them with more general disturbances of the physiology of the body is obvious to those of us who are struggling with the problems of internal medicine. The knowledge of the dermatologist has become an invaluable aid to the internist.

Diagnosis has always been very difficult. Those surprising individuals who find it easy neither convince nor excite emulation on the part of the rest of us. We must elicit with great care the case history, the development of symptoms, the result of all the various examinations of the patient, including many investigations by the clinical laboratories, the x-ray and others.

After all this has been done it too commonly happens that we have failed to find enough that is crucial to justify a conclusion as to diagnosis, or even to direct a lead as to a line of farther search. If then, as we keep the patient under observation, we detect a skin lesion that can be seen and touched our hopes rise and we seek from the dermatologist a suggestion as to the nature and cause of the illness that may be associated with such cutaneous symp-

toms. Very often his discussion of the case is not only helpful to us but also is of great benefit to the patient.

In therapeutics, also, we listen to the dermatologist. When we send a patient to him it commonly happens that the patient is sent back to us for treatment along special lines and this treatment may prove to be indispensable for the restoration of health.

For these reasons we call upon the dermatologist much more frequently and with greater confidence than formerly when we were wont to ask chiefly for "the name of this lesion."

The internist has always focussed his attention on certain of the external symptoms and has relied upon them very largely for diagnosis. Conspicuous examples of such diseases are the usual exanthemata.

In conditions characterised by purpuric lesions great difficulties are encountered. Here a broad outlook is indispensable and we must consider such widely diverse causes as a hæmophilic tendency and very severe fatal sepsis. Then too there are the arthritic purpuras that no one has quite satisfactorily classified. Certainly here the visible lesions usually have their chief importance because of their relation to the underlying general causes.

Doctor Wile's remarks about the lymphoblastomatous states are of the first importance. This group of diseases frequently offers hard problems in diagnosis. There are so many atypical pictures that baffle us for a long time both in estimating the nature of the disturbance and in planning our therapeutic attack. Obviously we must learn from Doctor Wile that a study of the condition of the skin may give the earliest hint as to the diagnosis. The fact that two of his patients presenting a condition that was legitimately classed as leucæmic, have recovered tends to lighten a trifle the gloom that hung over the prognosis of this disease.

In conclusion I wish to thank Doctor Wile for his paper

this evening and to express to him the pleasure that internists feel in cooperating with those of his group for the welfare of our common patients.

DISCUSSION

HOWARD FOX
New York

It is always a pleasure to listen to Dr. Wile's thoughtful contributions to dermatology and we are specially glad to do so tonight and thus show appreciation of our former Fellow in the Academy.

Dr. Wile has done well to confine his attention to two phases of tonight's subject. He has clearly indicated the diseases of the skin which can be properly considered as focal infections in contradistinction to those which might be called focal irritative processes. He has also helped to clarify the difficult subject of cutaneous lymphoblastomas, especially the universal erythrodermas, which we see fairly often and the significance of which it is so hard to determine.

In the time at my disposal I would like to give some idea of the immense number of cutaneous lesions which denote systemic disease. Only a portion of these lesions are however treated by the dermatologist, whose advice is sought for diagnosis and for treatment of particularly obstinate dermatoses. It is in the teaching of dermatology (including syphilis) that the relationship to systemic disease is manifest and it is largely due to this fact that the comparatively liberal share of a crowded curriculum is devoted to this subject.

There are numerous systemic infections which cause cutaneous lesions, many of which do not properly come under the class of focal infections. Leprosy is an important disease which is usually treated by the dermatologist,

though many of its lesions are neurological. Even leprosy might be classed as a possible example of focal infection arising in the nasal mucosa though this has not been definitely proven. Anthrax, glanders and the rare cases of diphtheria cutis are examples of systemic bacterial infections with lesions of the skin. Purpuric eruptions are invariably seen in typhus, cerebro-spinal meningitis and Rocky Mountain spotted fever. The exanthemata are systemic infections in which the cutaneous lesions are essential for diagnosis.

Fungous infections which cause severe systemic symptoms include actinomycosis and coccidioidal granuloma, while protozoal infections are represented by malaria which may be accompanied by both types of herpes, by pigmentation and at times by gangrene.

Infestations by Vermes may result in elephantiasis of the legs and scrotum due to the *Filaria sanguinis hominis* or the curious soft tumors caused by the Guinea worm. Tape worms from both human beings and dogs may occasionally produce curious swellings in the skin suggesting sebaceous cysts.

Impairment of the general circulation is shown not only by the common diffuse type of passive hyperemia with bluish, cold and clammy hands, but also by the reticulated type (*livedo reticularis*) which occurs chiefly in children or adolescents and usually disappears in adult life. Ordinary chilblains and lupus pernio have a poor circulation as their basis. Striking circulatory disturbances occur in Raynaud's disease and in peripheral syphilitic arteritis, which shows similar cutaneous phenomena.

Gastro-intestinal disturbances are often accompanied by skin lesions, the frequent association of hives and toxic erythemas with indigestion being recognized even by the layman. In the average case of rosacea there is a history of indigestion and the frequency of hypochlorhydria makes it proper to administer hydrochloric acid as a routine procedure. The effect of alcoholism is most apparent in the

severe hypertrophic type (rhinophyma) which is only seen in men.

The relationship of diabetes to certain diseases of the skin is unquestioned as shown in some cases by the effect of diet and the administration of insulin. The list of skin affections seen in diabetes includes pruritus, pigmentation, furuncles, carbuncles, eczematous lesions, rare cases of xanthoma and gangrene. Greenwood, from a study of 500 cases of diabetes, concluded that the diabetic patient showed a higher incidence of skin diseases including skin infections, than do other persons.

Disturbances of the lipid metabolism is represented by xanthoma tuberosum, though there are many gaps in our knowledge of this disease, valuable contributions to this subject having been made by our guest, Dr. Wile. We are ignorant of the real cause of this disease as nothing is known of the location or action of the mechanism which regulates lipid metabolism.

Various neurologic diseases may cause skin lesions, such as perforating ulcers of tabes and leprosy, the trophic changes of syringomyelia and the vesicles of herpes zoster. While many cases of the latter affection are undoubtedly infectious some are toxic such as those following administration of arsenic.

One of the most interesting examples of skin lesions related to mental disease is dermatitis factitia accompanying hysteria. While the diagnosis of a self inflicted eruption can usually be made by an expert on the appearance of the skin alone, in many cases it is easy to recognize stigmata of hysteria, such as absence of corneal and pharyngeal reflexes, areas of anesthesia and altered personality. Neurotic excoriations are usually seen in the neurotic type of individual and the same is certainly true of those who have the peculiar habit of pulling out the hair, without apparent cause (trichotillomania). The importance of the effect on the skin of emotional and nervous states, acting through the gastro-intestinal tract, has lately been

shown in an exhaustive paper by Stokes. The action of mental emotion upon common and juvenile warts, though the lesions themselves are due to infectious agents, has been scientifically demonstrated by Bloch.

The relationship of endocrine dysfunction to cutaneous lesions is capable of definite proof in only a few of them. In many others it is probable and in still others possible. Owing to our lack of knowledge of the physiology and pathology of endocrine glands, we must, as Bloch says, be content for the present to collect material and classify cases in which an endocrine origin is either certain or highly probable. The rest must be left to future research. A definite endocrine relationship is known to exist in myxedema, Addison's disease, and certain affections related to the gonads, particularly in women. The basis of acne in either sex is undoubtedly an endocrine disturbance. Dysfunction of the ovaries causes certain changes during menstruation and pregnancy including pigmentation, herpes gestationis, so called dysmenorrheal dermatoses and impetigo herpetiformis. Numerous cutaneous lesions occur with more or less regularity in Graves' disease and in hypopituitarism though none are absolutely diagnostic. There is strong evidence that scleroderma represents an endocrine disturbance and various observations suggest the same causation for vitiligo, some cases of alopecia and acanthosis nigricans, ichthyosis, cutaneous calcinosis and various atrophic conditions such as essential telangiectasia and striae atrophicæ.

Of the pigmentary changes in the skin, other than those due to endocrine changes, jaundice is the commonest. Somewhat like jaundice in appearance is carotinemia, though it differs from the former in not affecting the sclera and in showing a tendency to certain localization. This disease which follows ingestion of food containing carotin is of special interest on account of the relationship or possible identity with vitamin A. Their effects at least are the same. Acanthosis nigricans, first described independently by Pollitzer and Janovsky, is usually accom-

panied (in the adult type) by malignant disease in the abdominal cavity. Pollitzer subscribes to Darier's theory that interference with the function of the abdominal sympathetic is the immediate link in the causation of cutaneous manifestations. The curious disease called pinta, though known by various names in the American tropics is an interesting example of one which has long been considered to be a fungous infection of the skin, but which now seems in all probability to be a systemic disease. My work on this affection in Mexico and Colombia which agrees with that of the Pinta Commission in Mexico, convinces me that neither aspergilli nor any other fungi are causative. In over ninety per cent of the cases the Wassermann test is strongly positive and marked improvement results from treatment by arsphenamin or bismuth. The suggestion that the disease is a spirochetosis affecting the vegetative nervous system seems reasonable.

Among so called deficiency diseases which present cutaneous lesions are scurvy, beri-beri and probably pellagra though the last word has not been said about this curious affection.

To the above mentioned groups of diseases could be added the long list of cutaneous changes of senility; pruritus associated with internal malignancy; hydroa vacciniforme which in the majority of cases is caused by the presence of hematorporphoryn in the tissues which sensitizes them to ultraviolet rays; sclerema neonatorum so often associated with dehydration following severe diarrhea and in some cases showing definite fat necrosis; and finally the important subject of allergy in eczema, urticaria and angioneurotic edema which will doubtless be discussed by Dr. Coca.

While certain diseases or abnormalities are confined solely to the skin, enough has been said to show that there are innumerable cutaneous manifestations of systemic disease.

DISCUSSION

ARTHUR F. COCA
New York

Dr. Wile has remarked that one cannot in one evening cover the entire field indicated by the title of his discourse, and it may have been on account of his knowledge that I was to discuss this subject from the serological point of view that he has omitted from his paper formal mention of the group of dermatoses which are the cutaneous manifestations of allergic disease.

The cutaneous manifestations of allergy differ in their etiology, their mechanism and their histopathology. The clinical forms are:

First, urticaria. Second, atopic (inherited) eczema. Third, contact dermatitis; and Fourth, the cutaneous tuberculin reaction.

Dr. Wile has mentioned the toxic urticaria such as that produced by insect bites and stings, nettles and other direct irritants.

Allergic Urticarias are of two types—the reaginic and the non-reaginic.

The reaginic urticaria is seen, for example, when an overdose of an excitant of hay fever or asthma is injected into the subjects of these conditions. The reaginic wheal can be produced experimentally by the local intracutaneous injection of these excitants into asthmatic or hay fever subjects. It is always due to the irritative effect of the reaction between the specific excitant and the peculiar human antibodies known as reagins.

The non-reaginic allergic urticaria is often due to idiosyncrasies to foods, for example, strawberries; although the exciting cause is often not discovered. It is a remarkable fact that even the known excitant of non-reaginic urticaria usually fails to elicit a wheal upon its intracutaneous injection. The absence of reagins in the blood of

the subjects or of any other demonstrable sensitizing antibodies leaves us with no clue to the mechanism of this kind of urticaria.

The urticarial lesion does not depend upon any inherited abnormality of the skin; this is evident in the fact that any normal skin can be sensitized with the serum of a hay fever or asthmatic subject so that the injection of the specific excitant into the sensitized site will result in the formation of a typical wheal.

Atopic Eczema, on the contrary, seems to be due to an inherited abnormality of the skin because it is so often found in patients presenting a personal or family history of asthma or hay fever, and especially because of the evidence presented recently by Balyeat in an extensive series of cases, in which the influence of heredity is shown to be the same as that in the other atopic diseases. Whenever a specific excitant of the atopic eczema is found, reagins are always present in the blood.

Contact Dermatitis differs from atopic eczema, first, in the absence of an hereditary factor; second, in the fact that the sensitivity is confined strictly to the skin; third, in the absence of reagins in every instance; and fourth, in the fact that the excitants of it are all non-antigenic, whereas the specific excitants of atopic eczema are always antigenic.

The cutaneous sensitivity to tuberculin typifying the so-called hypersensitiveness of infection or infectious allergy is always dependent upon a previous infection with the corresponding bacteria. It is not subject, so far as we know, to an hereditary influence. The fully developed cutaneous lesion is said to resemble tuberculous tissue. All efforts to discover an antibody representing the specific mechanism of the tuberculin reaction have failed.

In conclusion, referring to Dr. Wile's suggestion that the skin manifestations of scarlet fever are due to a streptococcus septicemia, I may mention the fact that these

lesions in their typical development, including desquamation, have been produced by the injection of the sterile toxic filtrate of cultures of the streptococcus. They seem, therefore, to be an expression of an intoxication rather than the result of a localization of the bacteria.



RESOLUTIONS OF THE COUNCIL:

IN REGARD TO PRESCRIBING ALCOHOLIC LIQUORS

At the February meeting of the Council of The New York Academy of Medicine the following resolutions were adopted:

WHEREAS, Alcoholic liquors have a definite medicinal value, and

WHEREAS, Such liquors must be suitable for beverage use in order to fulfil such valuable therapeutic uses, and

WHEREAS, Distilled spirits and fermented liquors, both vinous and malted, have medicinal and nutritive value, be it

RESOLVED, That The New York Academy of Medicine would approve of such an amendment to the so-called Prohibition Laws as shall permit physicians to prescribe all such spirituous, vinous and malt liquors for medicinal purposes without limitation except by the laws of the several states, and be it further

RESOLVED, That The New York Academy of Medicine would approve of such legislation as will return the control of the practice of medicine to the several states

RESOLVED, That the above resolution be published in the Bulletin of The New York Academy of Medicine and that copies be sent prior to said publication, to the press and to the Senators from New York State and the representatives in Congress from New York City, and such other members of the Congress as the sub-Committee Appointed to Consider Legislation in Regard to Medicinal Alcohol deems wise

RESOLVED, That copies of the resolution be sent to the Secretaries of the Medical Societies of the various counties in New York State

RESOLVED, That if a bill be introduced in Congress which will restore the rights of the States in regard to the practice of medicine, the President of the Academy be authorized to appoint representatives of the Academy to further the advancement of such legislation.

UNETHICAL PRACTICE—AMBULANCE FEES

It has been reported to the Council of the Academy by the Committee on Public Health Relations that the Association of Private Ambulance Companies has brought to the attention of the staff of the Academy that it is a common practice for physicians to receive or demand a commission from the private ambulance companies for ambulance service rendered to a patient.

This is to advise you that the Council disapproves of this practice because it is unethical and contrary to the best interests of the profession.

FOSTER KENNEDY

Secretary

PUBLICATION OF THE SALMON MEMORIAL LECTURES

The first series of Thomas William Salmon Memorial Lectures was given by Dr. Adolf Meyer, Professor of Psychiatry, Johns Hopkins University, and Director of the Henry Phipps Psychiatric Clinic, Baltimore, on the subject "Psychobiology," Friday Evenings, April 8, 15 and 22, 1932, at 8:30 o'clock, at the Academy.

The Academy has arranged for the publication of the series. The volume will be ready in the Fall. The price will be about \$1.75. Subscriptions may be sent to the Academy.



LIBRARY NOTES

REPRINTS RECEIVED

In the year 1924 before we moved from 43rd Street, 6,422 reprints and pamphlets were cataloged. After this, fewer were done for some years except those from magazines we did not take or those which carried a new term in their titles. In 1929 we received 26,878 reprints, and after a period of trial, we reckoned that it would cost \$6,000.00 to catalog them all. The Library Committee determined in 1931 merely to file reprints away by author without cataloging (for they are indexed by author and subject in the *Quarterly Cumulative Index Medicus*) and to use them when possible, especially for lending purposes.

In 1931, 18,950 were filed in this way, but only about one a day was used. It cost about \$1,200.00 to do this filing. Also in the year 1931, 1,636 pamphlets and reprints from magazines we do not take, were cataloged. We were getting cramped for room in the pamphlet boxes so a stop had to be called in January 1932. The Library Committee has decided that at the present time it is too costly in money and space to attempt to catalog or keep all the reprints given to us each year. The Committee thinks it is wiser to spend money cataloging material which is not indexed already in the *Quarterly Cumulative Index Medicus*, such as articles in the systems of medicine, etc., medical theses, and some papers in certain magazines not included in the *Index*.

Fellows of the Academy, however, are informed that if they wish their reprints filed away by author they should send them to the Academy requesting that be done.

RECENT ACCESSIONS

MARCH AND APRIL

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N. Y., Hoeber, 1932, 3 v.
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- Fox, C. The mind and its body; the foundations of psychology.
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PROCEEDINGS OF ACADEMY MEETINGS

MARCH AND APRIL, 1932

MARCH

STATED MEETINGS

Thursday Evening, March 3, at 8:30 o'clock

- I. EXECUTIVE SESSION
 - Reading of the Minutes
 - Election of Fellows
- II. PAPERS OF THE EVENING
 - Symposium on syphilis of the central nervous and circulatory systems
 - a. Treatment of neurosyphilis, Harry C. Solomon, Assistant Professor Psychiatry, Harvard Medical School
 - b. Cardiovascular syphilis, Edwin P. Maynard, Jr., Associate Physician, Brooklyn Hospital.
 - c. Pathological viewpoint, Harrison S. Martland, Pathologist, Newark City Hospital
 - Discussion opened by Harlow Brooks, Visiting Physician, Bellevue Hospital

Thursday Evening, March 17, at 8:30 o'clock

The Sixth Harvey Lecture "Experimental Epidemiology"

Leslie T. Webster, Rockefeller Institute, New York

This lecture takes the place of the second Stated Meeting of the Academy for March.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, March 1, at 8:30 o'clock

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Cases from the Polyclinic Hospital
 - b. Cases from the City Hospital
 - c. Miscellaneous cases
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION
 - Appointment of Nominating Committee

SECTION OF SURGERY

Friday Evening, March 4, at 8:30 o'clock

Symposium on Surgical Tuberculosis

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES AND PAPERS

- a. 1. Tuberculous peritonitis
2. Tuberculous cervical lymphadenitis
3. Tuberculous dactylitis
4. Tuberculous osteochondritis of ribs and sternum

Paper:—Treatment of surgical tuberculosis with the Carbon-Arc Lamp, Paul Kurt Sauer

- b. Three cases of tuberculous cervical lymphadenitis treated by excision

Paper:—Results of excision of tuberculous cervical lymph glands, John Munn Hanford

- c. 1. Tuberculoma of cecum: One-stage resection with ileo-colostomy. Two cases
2. Tuberculoma of cecum: Perforation of terminal ileum; ileostomy; ileo-colostomy; resection
3. Tuberculoma of cecum: Acute appendicitis; appendectomy; fecal fistula; ileo-colostomy; resection

Paper:—Tuberculoma of cecum, Joseph E. J. King

III. DISCUSSION, Hugh Auchincloss, Willard B. Soper, New Haven (by invitation)

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF NEUROLOGY AND PSYCHIATRY

joint meeting with the

NEW YORK NEUROLOGICAL SOCIETY

Tuesday Evening, March 8, at 8:30 o'clock

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Some principles in the therapy of multiple sclerosis, Richard Brickner

Discussion, H. A. Riley

- b. Concerning a newer conception of the etiology of polyneuritis, Israel Wechsler

Discussion, Israel Strauss, Thomas Mackey (by invitation)

- c. Critical phases in the development of the cerebral cortex with special reference to behavior, Frederick Tilney

III. DISCUSSION, Henry H. Donaldson, Philadelphia (by invitation), Orthello R. Langworthy, Baltimore (by invitation), Samuel T. Orton

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Wednesday Evening, March 9, at 8:30 o'clock

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Address on "Robert Koch and the golden anniversary of his discovery of the tubercle bacillus," S. Adolphus Knopf

- b. Hieronymus Fracastorius: A brief survey of his life and work on syphilis, Paul E. Bechet
 - c. A note on the etymology and history of the word syphilis, Prof. George L. Hendrickson, Yale University (by invitation)
 - d. Fracastoro: After thoughts of a translator, Prof. Wilmer Cave Wright, Bryn Mawr College (by invitation)
- Discussion, Haven Emerson

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF PEDIATRICS

Thursday Evening, March 10, at 8:30 o'clock

I. EXECUTIVE SESSION

Appointment of Nominating Committee

II. PAPER OF THE EVENING

Radiation in the treatment of disease, Ethel M. Luce-Clausen, University of Rochester (by invitation)

III. DISCUSSION, Alfred F. Hess, E. E. Free (by invitation)

SECTION OF MEDICINE

Tuesday Evening, March 15, at 8:30 o'clock

I. PAPERS OF THE EVENING

- a. Treatment of polycythemia vera, Kenneth R. McAlpin
- b. Precordial pain in patients without organic heart disease, Herman Hennell (by invitation)
- c. Transient ventricular fibrillation, Sidney P. Schwartz
- d. Observations on human capillaries, Irving S. Wright (by invitation)
- e. The ratio of correlation between Ambard's renal sodium chloride threshold and the systolic arterial pressure, Harris A. Houghton
- f. A study of the average diet, Benjamin I. Ashe (by invitation)
- g. The relationship of pathogenic bacteria to respiratory diseases in infants, Yale Kneeland, Jr. (by invitation)
- h. The association of psoriasis with rheumatoid arthritis, Martin H. Dawson (by invitation)
- i. Gall-bladder infection and arthritis, Edward F. Hartung (by invitation)
- j. Inverted thoracic stomach, Zachary Sagal

II. DISCUSSION, Walter W. Palmer, Herman O. Mosenthal, Bernard S. Oppenheimer

III. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, March 16, at 8:30 o'clock

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

1. Incidence and prevention of perivesical suppuration following suprapubic cystotomy, Lewis T. Mann
2. Recent observations of European urological clinics. (Motion picture demonstration), Clyde W. Collings, Charles H. Shivers (by invitation), Edwin Beer

III. PAPERS OF THE EVENING

1. Polycystic kidney in the newborn—case report, James Denton (by invitation)
2. The use of bacterial filtrate (anti-virus) in genito-urinary infection, Louis Nerb (by invitation)
3. Problems of prostatism suggested by an analysis of 100 cases, Nathaniel P. Rathbun

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF OTOLARYNGOLOGY

Wednesday, March 16

FROM THE OTOLARYNGOLOGICAL AND LABORATORY DEPARTMENTS OF THE BETH ISRAEL HOSPITAL

I. AT THE HOSPITAL (16th St. and Stuyvesant Park, East, beginning at 2:30 P. M.)

- a. Demonstration of procedures in biochemistry, Ella H. Fishberg
- b. Demonstration of bacterial subcultures and charts of findings in otolaryngological cases, L. G. Hadjopoulos (by invitation)
- c. Demonstration of pathological specimens from otolaryngological cases, Alfred Plaut
- d. Demonstration of the von Schilling blood count, M. Arthur Weiss (by invitation)
- e. Demonstration of differential diagnosis in laryngeal tuberculosis and non-malignant and malignant lesions of the larynx, Joseph W. Miller (by invitation)
- f. Demonstration of pathologic lesions of the paranasal sinuses, William Spielberg
- g. Demonstration of current service cases in otology, Alfred A. Schwartz (by invitation)
- h. Demonstration of current service cases in rhinology, J. Coleman Scal

II. AT THE ACADEMY 7 P. M. PRE-MEETING DINNER

III. AT THE ACADEMY (8:30 P. M.)

- a. Auditory acuity in hypercholesteremia, Nathan Thaler (by invitation)
- b. The significance of blood cholesterol in atrophic rhinitis, Alfred Wachsberger (by invitation)
- c. The blood picture in otolaryngology, M. Arthur Weiss (by invitation)

- d. The management of the biopsy in laryngeal cases, Alfred Plaut
- e. Recent advances in biochemistry in relation to otolaryngology,
Ella H. Fishberg
- f. The value of subcultures in otitic infections, L. G. Hadjopoulos,
(by invitation)

Discussion opened by Samuel J. Kopetzky

Continued by Ward J. MacNeal, John A. Killiau (by invitation),
Andrew A. Eggston, Marshall C. Pease

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, March 18, 1932, at 8:30 o'clock

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
Intermittent hydrarthrosis. Apparent cure by synovectomy
Discussion opened by Paul C. Colonna, Arthur Krida
- III. PRESENTATION OF CASES
 - a. Dislocation of the shoulder in epilepsy
Demonstration of patient exhibiting two types of pathology
 - 1. Traumatic osteoarthritis of the left shoulder. Resection of humeral head
 - 2. Recurrent dislocation of the right shoulder. Nicola operation, Arthur Krida
 - b. Generalized neurofibromatosis: localized sciatic neurofibromata.
Operation, Arthur Krida, John C. McCauley, Jr. (by invitation)
 - c. Congenital bilateral absence of tibia. Lower two-thirds. Results of plastic operations, Arthur Krida
 - d. Reconstruction of the anterior crucial ligament of the knee joint, Arthur Krida
 - e. Repair of ruptured ligamentum patellae. Gallie operation, Arthur Krida
 - f. Intermittent hydrarthrosis of the knee. (Periodically recurrent hydrarthrosis). Two cases, Arthur Krida
 - g. 1. Intermittent hydrarthrosis
 - 2. Splint for the correction of finger contracture. Edgar D. Openheimer

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF OPHTHALMOLOGY

Monday Evening, March 21, at 8:30 o'clock

MT. SINAI AND MANHATTAN EYE AND EAR SERVICES

I. EXECUTIVE SESSION

- a. Reading of minutes
- b. Appointment of Nominating Committee

II. REPORT OF CASES

- a. A case of retinitis striata, Donald Scott Van Nostrand (by invitation)
 - b. A case of plexiform neurofibroma of lid (with lantern slides of microscopic specimens), F. C. Keil (by invitation)
 - c. Marginal cyst of optic disc, Joseph Levine
 - d. A case of tularemia, James G. Dwyer
 - e. Pathology of perivascular retinal atrophy of unknown etiology, David Wexler
 - f. Report of a case of subchoroidal hemorrhage diagnosed as sarcoma of choroid, L. W. Crigler
 - g. A fundus sign in severe anemia, Herman Weiss (by invitation)
 - h. Experiences with tuberculin (in diagnosis and treatment) in ophthalmology, A. A. Eggston
- Discussion, Arnold Knapp, Bernard Samuels, Ernest F. Krug

III. PAPER OF THE EVENING

- Minor points of importance in ophthalmic plastic surgery, Edmund B. Spaeth, Philadelphia (by invitation)
- Discussion, John M. Wheeler, Webb W. Weeks

IV. DEMONSTRATIONS BEFORE THE MEETING (beginning at 7 o'clock)

- a. Cases presented by a slit lamp group
- b. Various pathological specimens, Joseph Levine
- c. Unusual pigmented mass in periphery of fundus. Demonstration with binocular ophthalmoscope, Martin Cohen

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, March 22, at 8:30 o'clock

I. READING OF THE MINUTES

Evening devoted to "Symposium on the Treatment of Malignancy of the Female Genital Tract by Radiant Energy"

II. PAPERS OF THE EVENING

- a. The physical principles applied in the radiation treatment of malignant gynecological conditions, Carl Braestrup, B.Sc., P.E. (by invitation)
 - b. Radiation in carcinoma of the cervix. Report of 1925 and 1926 series at the Memorial Hospital, William P. Healy, John A. Kelly (by invitation)
 - c. Radiation therapy in gynecological malignancy, Ira I. Kaplan
- Discussion opened by Maurice Lenz

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

AFFILIATED SOCIETIES

New York Meeting of the

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Under the auspices of The New York Academy of Medicine

Wednesday, March 16, at 8:15 P. M.

- I. Further Studies on Etiology of Goiter with Particular Reference to the Action of Cyanides, D. Marine, E. J. Baumann, A. W. Spence and A. Cipra
- II. Phenomenon of Local Skin Reactivity to Bacterial Filtrates in the Treatment of Mouse Sarcoma 180, G. Shwartzman and N. Michailovsky
- III. An Intravascular Lesion in Poliomyelitis Induced by Feeding in *Macacus cynomolgus*, R. S. Saddington (introduced by S. Flexner)
- IV. Anti *Bacillus coli* Bacteriophage in the Treatment of *B. coli* Peritonitis in Mice, H. Zaytseff-Jern, H. D. Harvey, and F. L. Meleney
- V. Note on the Determination of Blood Fat, H. E. Himwich
- VI. Absorption of Insulin by Nasal Mucous Membrane, W. S. Collens and M. A. Goldzicher
- VII. Return of Gastric Acidity after Subtotal Gastrectomy and Double Vagotomy, P. F. Shapiro and B. N. Berg
- VIII. Further Studies on Continuous Secretion of the Pancreas, T. F. Zucker, P. G. Newburger and B. N. Berg

THE NEW YORK ROENTGEN SOCIETY

in affiliation with The New York Academy of Medicine

Monday Evening, March 21, at 8:30 o'clock

- I. DEMONSTRATION OF INTERESTING CASES AND ROENTGENOGRAMS
- II. 9:00 O'CLOCK
Tuberculosis of bones and joints, Ralph S. Bromer, Philadelphia (by invitation)
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

NEW YORK PATHOLOGICAL SOCIETY

In affiliation with The New York Academy of Medicine

Thursday Evening, March 24, at 8:30 o'clock

- I. DEMONSTRATION OF PATHOLOGICAL SPECIMENS
- II. PAPERS OF THE EVENING
 - a. Isolated necrotizing arteritis and subacute glomerulonephritis in a case of gonococcal endocarditis, Milton Helpern and Max Trubek
 - b. Some problems in medical mycology, J. Gardner Hopkins
 - c. Classification of yeast-like parasites, Rhoda W. Benham (by invitation)
 - d. Classification of dermatophytes, Chester W. Emmons (by invitation)
- III. EXECUTIVE SESSION

APRIL
STATED MEETINGS

Thursday Evening, April 7, at 8:30 o'clock

I. EXECUTIVE SESSION

Reading of the Minutes

Election of Fellows

II. PAPERS OF THE EVENING

Symposium on Psycho-neuroses in children

a. Point of view of human relationships, David M. Levy, Chief of Staff, Institute for Child Guidance

b. Pediatric standpoint, Herbert B. Wilcox, Professor Diseases of Children, Columbia University

c. Certain pediatric doubts about modern psychiatry, Bronson Crothers, Assistant Professor of Pediatrics, Harvard University

Thursday Evening, April 21, at 8:30 o'clock

The Seventh Harvey Lecture

"Pathological and Clinical Problems in the Study of Osteomalacia"

Ludwig Pick, Berlin, Germany

This lecture takes the place of the second Stated Meeting of the Academy for April.

SECTION MEETINGS

SECTION OF SURGERY

joint meeting with the New York Gastro-Enterological Association

Friday Evening, April 1, at 8:30 o'clock

I. EXECUTIVE SESSION

a. Nomination of Section Officers and one member of Advisory Committee

b. Reading of the Minutes

II. PAPERS OF THE EVENING

a. Duodenitis, Edward L. Kellogg

b. The results of medical and surgical treatment of peptic ulcer, Robert K. Felter (by invitation), Sydney Weintraub

III. DISCUSSION, Paul W. Aschner, Armistead C. Crump, John E. Jennings, Ross Golden

SECTION OF DERMATOLOGY AND SYPHILIOLOGY

Tuesday Evening, April 5, at 8:30 o'clock

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

a. Miscellaneous cases

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

Nomination of Section Officers and one member of Advisory Committee

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, April 12, at 8:30 o'clock

I. READING OF THE MINUTES

II. NEURO-PATHOLOGICAL PRESENTATIONS

- a. Brain lesions in gas bacillus infection
- b. Cases of intracranial aneurysms
- c. Traumatic intra-uterine cerebral hemorrhage, Irving J. Sands, Max Lederer

Discussion, D. Charles Davison

III. CLINICO-PATHOLOGICAL PRESENTATIONS

- a. A case of Paget's disease with neurologic complications
- b. A case of xanthomatosis (Schuller-Christian syndrome) with changes in the central nervous system, Moses Keschner, Charles Davison

Discussion, Louis Hausman, Bernard Sachs, Emanuel D. Friedman

IV. PAPERS OF THE EVENING

- a. An intravenous pharmacodynamic study of the autonomic nervous system in cryptogenic epilepsy, J. Notkin (by invitation)

Discussion, Frank Pike (by invitation)

- b. Problems of delusion, Eugen Kahn, Yale University (by invitation)

Discussion, Louis Casamajor, Paul Schilder, Clarence Oberndorf, Bernard Sachs

V. EXECUTIVE SESSION

Nomination of Section Officers and one member of Advisory Committee

SECTION OF PEDIATRICS

Thursday Evening, April 14, at 8:30 o'clock

I. EXECUTIVE SESSION

Nomination of Section Officers and one member of Advisory Committee

II. PAPERS OF THE EVENING

- a. The effect of environment on the incidence of rheumatic fever, John R. Paul, New Haven (by invitation)

- b. Signs of rheumatic carditis, Currier McEwen (by invitation)

- c. Effect of change in climate on the rheumatic infection in children with heart disease, T. Duckett Jones, Boston (by invitation)

- d. Treatment of chorea with induced fever, Lucy Porter Sutton

- III. DISCUSSION, Charles Hendee Smith, Homer F. Swift, Martin H. Dawson (by invitation), Alvin F. Coburn

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, April 15, at 8:30 o'clock

This meeting will be held at the Hospital for Joint Diseases,
1919 Madison Avenue

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. 1. Cases of prespondylolisthesis and spondylolisthesis
2. A case of reconstruction arthroplasty for osteoarthritis of the hip
3. A case of polyarthritis exhibiting early effects of gangliectomy, S. Kleinberg

- b. 1. A case of chronic osteomyelitis treated with maggots
- 2. Result of operation on a case of subluxation of the temporo-maxillary joint, J. Buchman (by invitation)
- c. Two cases of tendon transplantation for deltoid paralysis, I. Zadek
- d. Case illustrating results of tendon transplantation, L. Mayer
- e. Demonstration of the arthroscope, M. Burnan (by invitation), H. Finkelstein, L. Mayer
- f. Demonstration of case of Krunkenberg amputation, N. Ransohoff
- g. 1. Fracture dislocation of the shoulder (Nicola operation)
- 2. Fracture dislocation of the ankle
- 3. Open reduction of ununited fracture of patella, I. Balensweig
- h. X-ray demonstration of bone lesions in certain skin diseases, M. Pomeranz
- i. Demonstration of cases of epiphyseal separation at the hip, S. Jahss (by invitation)
- j. A comparison of the guinea pig inoculation and a culture method in the diagnosis of bone and joint tuberculosis, J. Blair (by invitation)
- k. The clinical value of phosphatase estimations in bone diseases, A. Bodansky (by invitation)
- l. The pathological changes in a case of traumatic osteoporosis of the femur, H. Jaffe (by invitation)
- m. Abbott bone lengthening operation—new traction device and stabilizer, H. Finkelstein
- n. End results of the bifurcation operation, W. Galland (by invitation)
- o. The injection treatment of varicose veins and ulcers, I. Tunick (by invitation)

III. EXECUTIVE SESSION

Nomination of Section officers and one member of Advisory Committee

SECTION OF OPHTHALMOLOGY

Monday Evening, April 18, at 8:30 o'clock

I. READING OF THE MINUTES

II. FIRST PAPER OF THE EVENING

Unilateral exophthalmos in intracranial tumors and its significance (illustrated by lantern slides), Charles A. Elsberg, Clarence C. Hare (by invitation), Cornelius G. Dyke (by invitation)

III. REPORT OF CASES

A case of Lindau's disease, Ralph I. Lloyd

A case of congenital venous angioma of the retina—autopsy findings, Ernest F. Krug

IV. SECOND PAPER OF THE EVENING

Cerebral blood vessel tumors (hemangioblastomas) and malformations

AFFILIATED SOCIETIES

THE NEW YORK ROENTGEN SOCIETY

in affiliation with The New York Academy of Medicine

Monday Evening, April 18, at 8:30 o'clock

- I. 8:30 to 9:00 o'clock
Demonstration of interesting cases and roentgenograms
- II. 9:00 o'clock
 - a. Roentgenographic findings in the thorax of the new-born infant; normal and pathological, A. L. L. Bell
 - b. Roentgen therapy in infections of the upper respiratory tract, L. M. Andersen
- III. Discussion, Charles A. Weymuller
- IV. EXECUTIVE SESSION

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Under the auspices of The New York Academy of Medicine

Scientific and Annual Business Meeting

Wednesday, April 20

Business meeting, 8:15 P. M.—Scientific meeting, 8:30 P. M.

- I. Quantitative Difference in a Rabbit-Ovulating Dose of Prolan and Anterior Pituitary Extract, S. L. Leonard (introduced by P. E. Smith)
- II. Effect of Antero-Pituitary Hormones Upon Blood Sugar, J. Eidelsberg (introduced by H. O. Mosenthal)
- III. Serum Phosphatase Changes in Calcium Deficiency and in Ammonium Chloride Osteoporosis, A. Bodansky, H. L. Jaffe, and J. P. Chandler
- IV. Action of Some Anesthetics on the Secretion of Phenol Red by Kidney Tubules in vitro, R. Chambers and M. Belkin
- V. A Comparison of the Blood Picture in Treated and Untreated Syphilis Patients, P. D. Rosahn and L. Pearce
- VI. Effect of X-ray on Polionmyelitis Virus in vivo and in vitro, M. Lenz and C. W. Jungeblut
- VII. Experimental Enhancement of Malignancy in the Brown-Pearce Rabbit Tumor, A. E. Casey
- VIII. Quantitative Method for Determination of Precipitin in Small Volumes of Rabbit Anti-Crystalline-Egg-Albumin-Serum, J. T. Culbertson and B. C. Seegal

NOTICE TO MEMBERS

The Western New York Section of the Society is holding a joint meeting with the A. A. A. S. under Dr. William H. Park's chairmanship June 21 and 22 at Syracuse. The Western New York Section invites the members of the New York Section to participate in the program. Members desiring to take part please communicate directly with Dr. M. S. Dooley, Syracuse University College of Medicine.

NEW YORK PATHOLOGICAL SOCIETY

In affiliation with The New York Academy of Medicine

The regular meeting of the New York Pathological Society on Thursday evening, April 28, 1932, was omitted, owing to the fact that the annual meeting of the American Association of Pathologists and Bacteriologists was held in Philadelphia on this date.

FELLOWS ELECTED APRIL 7, 1932

Eugene John Bozsán	1130 Park Avenue
John K. de Vries.....	901 Lexington Avenue
Jacob Friedman	30 West 59 Street
K. Gosta Hansson.....	33 East 61 Street
Abraham Jerskey.....	27 West 96 Street
Frank Conrad Keil.....	660 Madison Avenue
Edwin Post Maynard, Jr.....	85 Pierrepont Street, Brooklyn
Samuel Monash.....	2 East 54 Street
Ralph A. Richardson.....	Bristol, Connecticut
Henry Silver.....	290 West End Avenue
Francis Patton Twinem.....	901 Lexington Avenue

FELLOWS ELECTED MAY 5, 1932

Eugene Calvelli	Port Washington, L. I.
Howard A. Patterson	107 East 67 Street
Robert Chobot	30 West 59 Street
Geza Nemet	1112 Park Avenue
Samuel W. Hamilton.....	Bloomingdale Hospital
Harry Weiss	1112 Park Avenue
Walter S. Atkinson.....	168 Sterling Street, Watertown
David F. Gillette.....	811 Park Street, Syracuse
George S. Amsden.....	136 East 64 Street
Wilbur A. Sawyer	Rockefeller Institute
Hans Smetana	630 West 168 Street

Medical Association, a member of the County and State Medical Societies, a member of the American Urological Society; a member of the Urological Society, a member of the Society of Alumni to Lenox Hill Hospital, Cystoscopist to Lenox Hill Hospital and Chief Urologist to Lenox Hill Dispensary.

STAFFORD McLEAN, M.D., 17 East 71 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1908; elected a Fellow of the Academy March 6, 1913; died, March 13, 1932. Dr. McLean was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the Society of Alumni of Bellevue Hospital, Physician to Babies' Hospital, Consulting Pediatrician to New York Orthopedic Hospital, and Consulting Physician to Tuxedo Memorial and Horton Memorial Hospitals.

FRANK EBENEZER MILLER, M.D., 17 West 54 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1884; elected a Fellow of the Academy April 5, 1906; died, April 15, 1932. Dr. Miller was a Fellow of the American Medical Association, a member of the County and State Medical Societies, Consulting Physician to Stuyvesant Square and St. Francis' Hospitals, New York City and Loomis Sanitarium, Loomis, N. Y. He was at one time the Chief Laryngologist at the Bellevue Hospital and the Vanderbilt Clinic. Dr. Miller was the author of a number of books on the voice and devised a method of voice production.

GEORGE EDMUND MUNROE, M.D., 223 East 17 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1877; elected a Fellow of the Academy May 5, 1892; died, April 3, 1932. Dr. Munroe was a Fellow of the American Medical Association and a member of the County and State Medical Societies.



BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VIII

JUNE, 1932

No. 6

ANNUAL GRADUATE FORTNIGHT

Disorders of the Circulation
October 19 to 30, 1931

PSYCHONEUROSES AND NEUROSES AND THE HEART*

ROBERT H. HALSEY
New York

Introduction.

In these days of investigative psychology and applied psychiatry a program to be complete must consider the relation of the psychoneuroses. This is particularly true with the subject allotted since the control of the cardiovascular system lies wholly within the domain of the involuntary nervous system.

Every physician, practicing in whatever branch or specialty of medicine, meets at some time the patient who is more or less the victim of an unstable involuntary nervous system and the patient requires proper diagnosis and advice. It is the responsible task of the physician, therefore, to determine the part that the nervous system contributes to the unhappiness of the moment and give adequate and appropriate relief and comfort.

The text books have gradually eliminated discussion of the phenomena which were formerly known as neuroses. There are two reasons why this has happened; first, be-

*Delivered October 29, 1931.

cause most of those disturbances had a characteristic pathology; and second, because the term "cardiac neurosis" was so vague and ambiguous that a definite mechanism of the nervous system was not recognized. But while the authors are quite correct in omitting the topics that were improperly included under this caption it is as great an error to ignore the fact that there is a group of disturbances of the circulation and heart definitely due to disorders of the involuntary nervous system. The omission from the text books of the name, definition and description of neurosis unfortunately does not inhibit nor prevent the incidence of the disorder.

That emotions were affecting the heart was recognized definitely in 1836 by Dr. John Calthrop Williams⁶ of London, who said,

"Allowing, however, that diseases of the heart have increased of late years, we have a clear and important explanation of the fact.

"With the advance of civilization, the physical and moral system of man becomes more sensitive, and then the passions necessarily acquire a greater influence over the animal organization; the more, also, the passions are curbed, after being once strongly excited and exercised, the more baneful is their influence on the nervous system, until they are completely subdued.

"When we reflect, therefore, on the powerful influence that mental emotions exercise over the action of the heart; on the changes affected, in this respect, by anger, hatred, and revenge—by love, joy, or sorrow—by avarice and ambition; when we credit our former assertion, that functional derangement will terminate in organic disease, and that this functional derangement is daily and hourly produced by the activity of these feelings; then we are bound to believe that disorders of the circulation and the heart have increased of late years, and will still increase in proportion as the nervous system is affected by the more frequent and ardent operation of the passions . . ."

There are at least twenty-seven⁷ different varieties of personality depending upon the interplay of heredity, environment and adaptation. These influences render the individual the victim to a greater or less degree of the instinctive reactions.

McDougall⁸ has defined them as follows: (1) The instinctive reactions become capable of being initiated, not only by the perception of objects of the kind which directly excite the innate disposition, the natural or native excitants of the instinct, but also by ideas of such objects, and by perceptions and by ideas of objects of other kinds: (2) The bodily movements in which the instincts find expression may be modified and complicated to an indefinitely great degree: (3) Owing to the complexity of the ideas which can bring human instincts into play, it frequently happens that several instincts are simultaneously excited; when the several processes blend with various degrees of intimacy: (4) The instinctive tendencies become more or less systematically organized about certain objects or ideas.

He defines and lists the instincts and emotions as follows: The principal instincts of man "In the case of the principal powerful instincts the affective quality of each instinctive process and the sum of visceral and bodily changes in which it expresses itself are peculiar and distinct; hence language provides special names for such modes of affective experience, names such as anger, fear, curiosity; and the generic name for them is 'emotion'.

The Instinct	The Emotion	
Flight	Fear	
Repulsion	Disgust	
Curiosity	Wonder	
Pugnacity	Anger	
Self-abasement	Subjection	} Self-feeling
(Subjection)	(Negative)	
Self-assertion	Elation	
(Self-display)	(Positive)	
Parental	Tender	

Seven emotions plus pleasure and pain compounded others.

The Instinct	The Emotion
Reproduction	Lust
Hunger	Impulse to seize
	Feeding
Gregarious	Social
Collect and hoard	Ownership
Acquisitive	
Construct	Creativeness
Laughter	Amusement

The emotions, then, act by unknown processes to cause activity of the involuntary nervous system and thus become manifest in symptoms at one of the three levels as L. Brown³ has so well described: first, the psychical with obsessions; second, the sensory-motor, with paralysis, contracture, tic and anæsthesia; and third, the visceral with various vegetative neuroses.

But in whatever way the sympathetic system is brought into action it simulates the ordinary expression of certain emotions—preeminently the emotion of fear—tachycardia, palpitation, sweating, blanching extremities and gastrointestinal disturbances.

Dr. Cannon⁴ has shown that many changes of internal chemistry accompany the external evidences of emotional conflicts.

That a psychoneurosis may be based upon repressed or subconscious fear is clearly recognized and whenever the personal resistance is lowered by disease, emotional shock or psychic conflict our equanimity is impaired.

“In view of the demonstrated reactions of the mind to conditions of environment, used in its broadest sense, it appears justified to connect them with the heart disorders which occur so frequently with the emotions as the etiological factor. From work done by psychologists and psychiatrists it seems justified to point out that it is an unhappy status of mind due to unfulfilled desires and conflicts that

sets the stage, or conditions the onset of a cardiac disturbance, as one way of escape from unhappy situations, or as an offensive in the accomplishment of a much desired objective."

It is the circumstances of the environment, of the hereditary stuff, of the geographical position, of the educational attainments and even of disease that often determine the failure or fulfillment of legitimate human desires. Desires which may not have been formulated even in the conscious thought or words but the failure of achievement may be attended by conflicting emotions as poignant and keen as if the wish had been expressed.

The accomplishment of some desire may require building an offensive over a long period of time and then the neurosis becomes a substitute, an explanation and an asset (Casamajor).

DEFINITION

A cardiac neurosis⁶ is a visceral or organ neurosis and may be defined as a disorder of the physiologic action of the heart produced by an emotional reaction of the patient.

Experimental work has been done which suggests that certain substances acting upon the heart can produce a critical state of the heart muscle under which condition it will react to stimuli in a very different way than when the critical state does not exist. This conception recognizes the principle that one physiological derangement must exist before another stimulus will be effective to produce the abnormal reaction. Thus the patient with a neurosis of the heart must have had some psychological disturbance or conflict of sufficiently long duration to set the stage, or conditions, for an apparently unrelated event of emotional character to start an abnormal mechanism in the heart.

The emotional reactions affect disturbances of cardiac physiology by unknown processes but translate the effect of the stimulus by arousing activity in the involuntary nervous system which manifests the action in visible and

otherwise measurable changes. When the autonomic system is thus aroused the personality reacts with various psychoneurotic symptoms which may be but frequently are not related in the patient's consciousness directly to the original cause of the whole process—the conflict.

The repetition, or the continuation over a considerable period of time, of the pathogenic emotional reactions may produce changes which are of the nature of altered pattern reactions of the involuntary nervous system and with or without actual structural change.

The conception of chemistry which describes reactions as reversible and irreversible will, perhaps, also explain the conditions of the changes in the nervous system—that is, as long as the process remains reversible there is no structural change but when changes of structure occur the process becomes irreversible. Or, to restate the concept, as the lipases, or fat splitting enzymes, produce dextrorotary or levorotary acids depending upon inert substances added to the mixture. These chemical processes describe reactions to which the emotional reactions in psychoneuroses may be analogous.

The new mechanism may be initiated in a heart previously undamaged or it may complicate the action of a heart already structurally damaged by disease. Of itself it adds no disease process, it produces no structural change of visible pathology, it produces only a physiological derangement of action.

ETIOLOGY

To uncover the emotional pathogenesis requires tact and patience as well as skillful inquiry into the details of the physical and social conditions preceding the onset. It may be essential to understand the emotional history of the family as well as of the individual. The ambitions and desires of social attainments and financial independence. The previous and present marital and sex relations must be known to reveal the needs of an offensive or defensive attitude from the point of view of the patient. Prolonged

illness or sudden injury may be the precipitating cause. Ignorance of what constitutes disease of the heart and fear of sudden death seem to cause a much more profound psychoneurotic disturbance than fear of disease of any other organ. The intimate daily contact with one near and dear throughout the prolonged distress and suffering of heart failure with congestion terminating in death may set the stage for later psychoneurotic events. Parental reminders and inhibitions of children and professional inept suggestions or assertions during a physical examination whether routine in character or as preliminary to life insurance may initiate the emotional background of a psychoneurosis.

Toxic substances of tea, coffee, tobacco and alcohol in regular or irregular doses may act to render the heart more sensitive to the emotional struggle. Mechanical conditions such as distended stomach, or colon, and the accidental escape of air or gas into the abdominal cavity through the uterine tube during a test for patency may precipitate an unusual mechanism. It may not be easy to recognize the emotional factor in these mechanical discomforts but ignorance, surprise and fear may be the correlated emotional stimuli of the sympathetic system.

The symptom complex of neuro-circulatory asthenia (effort syndrome or irritable heart) appears to be due to an hereditary instability, or pathologic constitutional entity (Warthin). They are eliminated by our definition, which is—a disorder of the physiologic action of the heart produced by an emotional reaction of the patient.

Types of phenomena which are produced by the emotional conflicts will be manifest by changes of rhythm, rate and sensations; thus, there may be simple acceleration, premature contractions, either basal or apical in origin, paroxysmal tachycardia—of the various types, such as simple auricular flutter, fibrillation, or ventricular; and sensations of consciousness of the heart action or pain in the precordial region.

SYMPTOMS.

Hans Driesch⁵ has shown the relation between certain conscious phenomena and the vital processes. He believes that instinctive reactions are complex motions which do not rest upon an "historical basis" acquired by the individual. They are perfect from the beginning; they cannot be improved at least with regard to their specificity though they may be, perhaps with regard to the velocity with which they are performed. Pawlow⁶ has shown that hunger and the smell of food may have a sequence in the secretion of saliva and he has demonstrated that the sound of a bell may cause the flow of gastric juice and other conditioned reactions. It is common knowledge that emotions and suggestion, or auto-suggestion, can and do accelerate the heart rate or the gastro-intestinal tract.

The subjective sensations are described by the patient in terms of the individual's intelligence and culture—a knowledge of these feelings¹ is essential to the physician for a due appreciation of their place and importance in the clinical syndrome and the inquirer should phrase the interrogation so thoughtfully and in such simple language as not to suggest the character of the answer. Beware of the question with an entangling implication.

The patient will describe the symptoms in terms of fullness, bursting, pressure, or soreness. The character of the heart action may be said to be fluttering, pounding, vigorous, weak, throbbing. Often the complaint will be of hearing a pulsation in the ears and giving greatest annoyance when lying down to sleep. Occasionally breathing irregularities may be noted but actual dyspnoea does not belong to the neurosis but to some complicating structural damage. Dizziness, giddiness, faintness, choking or sensations of gripping of the throat, and swallowing and belching of air may be described. Sweating may be profuse and a tremor of marked degree may be present. Fatigue may be the chief complaint after relatively slight exertion. Occasionally pain referred to the precordium usually toward

the nipple or ventricular apex area may be the chief symptom and, more rarely, only careful analysis and repeated observations will differentiate it from coronary disease. In the analysis as Bramwell² has said, due consideration must be given to "the situation and character of the pain, to the constancy, intensity and circumstances which appear to influence it: the cause to which the patient attributes his pain and possible misconceptions on his part which call for correction; the personality of the individual, his surroundings, his suggestibility and his general outlook on his case; his responsibilities and his sense of responsibility; the existence of an inferiority complex, his financial position, and, it may be, the question of compensation and his attitude towards it." A variable and mobile systolic blood pressure may be found.

Differentiation from diseases, as myocardial degeneration, anæmia and toxic thyroid conditions is usually easy but may be difficult.

PHYSICAL EVIDENCE.

Absence of the usual results, symptoms and signs of structural damage or failing heart. Presence of one of the various types of arrhythmia, usually of paroxysmal onset. Often accompanied by a diffuse, vigorous action of the heart.

During the physical examination it is important not to introduce new suspicions or suggestions of disease and at the same time to be so systematically thorough as not only to have the complete picture but also to inspire confidence that all has been done that should be done. This will add weight to the opinion expressed.

DIAGNOSIS.

To the diagnosis of a cardiac neurosis the differential must be made between three conditions; first, is there structural damage and what is its etiology: second, is there a psychoneurosis arising from fear of heart disease

or fear of the results of heart disease: third, is there a visceral or cardiac neurosis—which is an organ neurosis and may be defined as a disorder of the physiologic action of the heart produced by an emotional reaction of the patient.

The student of medicine does not appreciate disorders not structurally demonstrable; for, often he is introduced to the consideration of diseases of the heart by observing hospital patients with advanced organic damage or patients in the late stages of cardiac failure. Such patients often are admitted and readmitted with congestive failure once or twice and then come to necropsy. The gross and microscopic pathologic findings often so impress the observer as to suggest two thoughts: first that structural changes are essential to even physiologic disturbances; that murmurs accompany all heart disease and indicate the onset of congestive failure and a rapid course to the necropsy table. This early experience with terminal congestive failure often makes it extremely difficult for the physician, even the more experienced practicing physician, to recognize later the part the emotions play in cardiac physiology.

The post war advances in knowledge of and popular interest in psychology have directed attention to the importance of psychic states in the life of the individual. Since a cardiac neurosis is a disorder of the regulatory mechanism of the heart the failure will be of this and not of the mechanical or structural system. If the disorder occurs after a structural damage there will be the combination of the two but in any event there will be an illogical or bizarre group of symptoms when compared with reactions incidental to failure of the myocardium.

In distinguishing the symptoms due to the structural change from those of emotional origin the skill and experience of the physician will be fully tested. The patient may be the spoiled and petted child; or the pampered and fearful young adult; or the frightened one of older age with

all the fears of "high blood pressure" or "hardening of the arteries."

If there is a well established organic damage the occurrence of sudden emotional excitement may precipitate the onset of congestive failure or of sudden death.

In arriving at a diagnosis it is necessary, first—to analyze the separate symptoms, then make a physical examination to discover the structural state and finally make an experimental test of the individual functions to discover deviations from normal; second—it is necessary to synthesize the findings into a syndrome fitting the pathologic physiology and indicating the pathogenesis.

PROGNOSIS.

In its broadest aspect, the prognosis is the answer the patient desires and about which he questions himself and may not question the physician, for the questions are not always consciously or verbally expressed.

If suspected of having heart disease he may question himself somewhat in the following manner—Have I, or have I not "heart disease," "angina pectoris," "arteriosclerosis," "high pressure," "hardening of the arteries?"

If he has some cardiac defect his introspection may follow this line of thought—Am I going to die, or am I going to get well or be "cured?" Shall I be ill a short or a long time? Shall I suffer pain or die suddenly? Shall I be permanently crippled? Will my earning capacity be affected? Shall I change or lose my job? Must I assume financial debt? Can I afford to be ill?

The replies to the patient should state the facts in such a way as to answer these questions and at the same time inspire courage, hope and assurance.

TREATMENT.

A rational psychotherapy is essential and must be built up by fostering favorable sentiments and emotions and

avoiding unfavorable emotional reactions. Do not vacillate. Give assurance of the absence of danger. Make favorable and avoid unfavorable suggestions. Be sympathetic in manner for it is often more important how a statement is made than what is said and how an act is performed than what is done. The intimation that the symptoms are "imagined" or that there is "nothing the matter" will most certainly arouse the emotions and resentment as well as depreciate the weight of any subsequent diagnosis and advice offered.

A regime of prescribed rest and wholesome meals. If there is no damage of the whole by disease rest will not be necessary. If there has been a prolonged period of rest on account of a suspected disease it may be necessary to graduate the increasing activity. The guiding thought should be that a neurosis in itself does not restrict the possible activity of the heart. But if there is actual disease it must receive consideration. Hydrotherapy may be employed to stimulate circulatory reactions. As much active out-door exercise as may be permitted for two objectives—to improve the tone of muscles of skeleton and heart and to convince the patient of the efficiency of his heart. Out-door recreational games played with others is an effective way to remove the gloom and cheer the ego.

For a brief period in the beginning mild sedatives, as bromides or phenobarbital may be of the greatest aid. Preparations of opium or digitalis should not be given except when needed to control an abnormal mechanism.

Tea, coffee, tobacco, alcohol and sexual excitement should be avoided since they act to render more sensitive the sympathetic nervous system.

As to surgery—Gordon has stated concisely: "No removal of tissue or organs, no artificial correction of disturbances, however accurately or skillfully they may be done, will succeed in making a psycho-neurotic discard his fixed ideas, his hypochondriasis, his abulias, his fears or

his obsessions." But skillful, technical analysis may indicate the rational therapy which will assist effective illumination to do its work.

Gain intelligent cooperation through frankness, understanding and confidence, keeping in mind that a cardiac neurosis is a disorder of the physiologic action of the heart produced by an emotional reaction of the patient.

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PATHOLOGY OF CANCER OF THE LARGE INTESTINE*

(ABSTRACT)

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An analysis of 104 cases of carcinoma of the large intestine is compared with results of other investigators who have compiled results of a greater number of cases. In the 10 year period during which the 104 cases were observed there were no instances of sarcoma or melanoblastoma. During the same period there were 2 cases of carcinoma of the ileum and 1 of the duodenum. Lubarsch reported on 1608 cases of carcinoma of the intestine, of which 1510 were in the large intestine (664 in colon; 846 in rectum), 69 in the duodenum, 22 in the ileum and 7 in the appendix. As compared with Lubarsch's figures for colon and rectum, the series of 104 cases was divided equally between these two sites.

Most cases of cancer of the large intestine occur in the fifth and sixth decades, but the maximum age incidence for carcinoma of the colon is slightly earlier than that for carcinoma of the rectum. The disease, however, may occur at any period of life.

Combining all age periods, cancer of the large intestine is more frequent in males than in females, and there is no apparent significant difference between colon and rectum. If the two sexes are examined separately it is found that the maximum age incidence for females is somewhat earlier than that for males. In the fourth and fifth decades the percentage of females affected is definitely greater than of males and to a lesser extent this applies to the sixth decade. These differences are more apparent as regards cancers of the colon than those of the rectum.

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Race distribution has not been studied in large series. Of the 104 cases color is mentioned in 100, and only 2 of these were negroes. This is probably significant because there is a large negro population in the community and in the hospital.

A study of anatomical distribution of cancers of the large intestine shows that slightly more than half occur in the rectum. Of the other half, about one third are found in the sigmoid, one third in the proximal part of the colon up to and including the hepatic flexure and the other third in transverse colon, splenic flexure and descending colon. There is no predilection for hepatic and splenic flexures.

The simplest anatomical classification is into (1) projecting or polypoid, (2) infiltrating and ulcerative, and (3) stenosing. Since these are descriptive terms, combinations may be made. Mucin production may occur in any of the gross and microscopic forms but is most common in the infiltrating fairly well differentiated adenocarcinomas. The term mucinous carcinoma is more literally correct than colloid carcinoma and is to be preferred. The character of the tumor is determined by its cellular content and arrangement rather than by an incident production of mucin.

Local extension and metastasis of rectum cancers is somewhat more frequent than in colon cancers, probably because of differences in lymphatic drainage. Of the cancers of the colon metastasis occurs in decreasing order of frequency from sigmoid, descending colon, transverse colon, hepatic flexure, splenic flexure, ascending colon (Hayes). Metastasis to structures other than lymph nodes is principally to liver, but lungs are not infrequently affected and there may be a generalized carcinomatosis including bones. Of great importance is the fact that lymph nodes near a cancer of the large intestine may be notably enlarged as the result of hyperplasia and may attain a diameter of more than 10 millimeters without being the seat of metastasis.

Polypi of the large intestine are of fairly frequent occurrence and often one or more in a gut the seat of multiple polyposis are malignant. The malignant change begins in the periphery and center and subsequently extends to the base. Polyposis is the best established precancerous lesion and probably originates in local epithelial hyperplasias. That all cancers of the large intestine originate in polypi, as has been claimed, has yet to be established. The fact that a cancer is a projecting polypous mass is no proof that it originated as a polypoid adenoma. To state that as cancer develops in one polyp the others disappear does not seem to have adequate proof. From Schmieden's clinic comes the report that 40 per cent of rectal cancers originate in polyps, and this appears to be the most amply supported statement in the literature.

Grading of large intestine cancers on the basis of microscopic criteria is of interest but has not as yet been adapted to a sufficiently large number of cases. As regards rectum it is probable, according to Stewart and Spies, that as anaplasia is more and more marked, the age incidence, duration of symptoms and length of life decrease. According to Rankin and Broders the more anaplastic the tumor the greater the incidence of metastasis, and the prognosis is determined more by the grades than by any other single factor. Indeed, they state, grade I cancers with metastasis have practically as good a prognosis as grades III and IV without metastasis. Of 100 cancers in our series of which material was available for microscopic grading it was noted that cancers of the upper colon as compared with cancers of the sigmoid and rectum show a high incidence of the anaplastic cancers of grades III and IV. This rate was due especially to the number of anaplastic cancers of the cecum and ascending colon. This contrast might not be so apparent in a larger series of observations. It cannot be said on the basis of this material that the correlation of grade, metastasis, duration and prognosis noted in the rectum is applicable to the upper colon, because the number of observations is too small. In general there is no reason for assuming that practically the cancers of

the colon are more disastrous to the patients than those of the rectum. Hence the importance of the microscopic grades in the upper colon cancers can be of use principally in making comparisons between cancers as they occur in that part of the intestine rather than as a basis of comparison between those in the colon and those in sigmoid and rectum.



MALIGNANCIES OF THE COLON*

THE MEDICAL ASPECT

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To me the medical aspect of malignancies of the colon is simple. It has but one objective—the making of a relatively early diagnosis, or, perhaps better put, the earliest possible potential, if not definite, diagnosis, so that the only effective therapy—surgery—may be utilized with a maximum chance of success. This is the only treatment worth considering at the present reading and to produce the greatest number of cures and to minimize the number of failures must be our great desideratum. Helping us is the fact that these malignancies in the main grow very slowly and as a rule metastasize late; hindering us is the fact that there is no characteristic symptom complex for there may be no symptoms or the symptoms may be so vague, so indefinite, so banal or commonplace that they will arouse no suspicion of serious trouble—a suspicion that would lead to the careful examination of the patient with the utilization of the necessary physical and chemical procedures that should lead to the correct diagnosis in the vast majority of cases. Of course a very early diagnosis can never be made except by accident for the life of these growths is far longer than usually believed. There must be a long latent period where diagnosis is impossible, but on the other hand there are very few of these cases in which the correct or at least probable diagnosis should not have been made months or even in some cases a year or more earlier if one had suspected its possibility and had set in train the proper investigations.

Cancer of the digestive tract *in toto* is the most common form of neoplasm. Cancer of the stomach, according to the Mayo statistics, is met with about as commonly as cancer of the entire large bowel; and while carcinoma of the rectum makes up one-half or three-fifths, or perhaps even

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more of large bowel neoplasms, nevertheless there is an appalling number of deaths in colonic new growths, many of which should have been prevented.

We do not know the cause of cancer of the colon; trauma may play a rôle, for the seats of potential injury by the fecal column, the sigmoid, the cæcum and the flexures, are in that order the sites of predilection. But the evidence is scant. Newcomb has shown there is little or no evidence of its origin from decubital ulcer; though Göckel collected a few cases from the literature apparently due to foreign bodies and a few rare cases have been reported secondary to tuberculous ulcer or to fecaliths associated with an appendical lesion.

Deaths from acute infections and from tuberculosis are steadily decreasing; deaths from cancer just as steadily increasing, an increase not accounted for by constantly improving diagnostic procedure and correspondingly better diagnosis. Something in our modern life, some of the incidents and accidents of an increasingly complex civilization—the emanations of modern life as it were—may contain the germ of such a cause. Is it our modern diet, with in some cases marked preponderance of animal protein; in other instances, the elimination of the more primitive types of food? Is it our habits of eating or may the tension and strain under which we live with their inevitable functional disturbances of the digestive tract play a part? Is it due to toxins or poisons peculiar to a modern environment? Why should digestive cancer be so rare among the primitive peoples of South America? Why does McGarrison see practically no cases in his abdominal surgery on thousands of hill dwellers in Northern India? Why such variation as to incidence in various countries? Does heredity play a rôle? Is there a contagious element? Until these questions are answered and until we know the cause our early diagnosis can only be made by the crude tests at our command.

It is a disease of later life, the fifth, sixth and seventh decades. Males are more frequently affected than females

and its growth is relatively slow. Billroth reported many years ago a case lasting ten years; but cases have been noted in early life and here the course is as a rule more rapid. Bernoulli more than twenty years ago collected 50 cases in patients under twenty years of age.

Large bowel cancer causes from 5 to 10 per cent of all deaths; it is the commonest cause of large bowel obstruction. According to some, 90 per cent of the cases are of this origin. It has an extremely high death rate. It may be multiple and while usually this is due to extension or metastases, Rankin and Borgen have recently reported sixteen cases from the Mayo Clinic with two or more primary lesions. Some of these are certainly due to malignant degeneration of multiple polyps. In the vast majority of cases it is primary; but cases have been described secondary to carcinoma of stomach or gall bladder.

Adenocarcinoma is the commonest form, but scirrhus is not rare and medullary and colloid forms are also seen.

The proximal half of the colon, rising as it does from the foregut, presents a somewhat different picture from the distal half. It has a better blood and lymph supply; its lumen is larger; the medium is more fluid and the absorptive qualities better. There is certainly a greater tendency toward the development of the more cellular types, with more tendency to bleeding, earlier and more marked systemic symptoms and possibly earlier metastases. In the distal half, the scirrhus type is probably more common with less systemic but earlier obstructive phenomena, with possibly later metastases. On the other hand, both forms are rather striking by the lateness of their metastases in the majority of cases.

Moynihan has called especial attention to the fact that constipation is the rule in left colonic growths, is rare in growths on the right side; while in a recent series with obstructive symptoms, 87 per cent were due to the former and 13 per cent to the latter.

The large, soft, fungating and encephaloid cancer of

cæcum and ascending colon rarely causes obstruction. Metastasis by blood or lymph channel is often surprisingly late. It often bears no relation to the size of the growth. A large growth of long duration may show no metastases; a small absolutely unrecognized scirrhus in the sigmoid may have an enormous metastasis in the liver which may be regarded as the primary lesion.

The general or systemic symptoms—anemia, loss of weight, strength and appetite, with an achlorhydria or low acid gastric reading—are late symptoms and the diagnosis should antedate their appearance or at least their marked manifestation. Sometimes on the other hand they may be the only symptoms and in every case with such symptoms and with no obvious cause, intestinal neoplasm should be considered as a potential factor, and careful physical and digital rectal examinations made as well as radiographic, fluoroscopic and stool studies.

According to Moynihan, the average duration of symptoms, of which the patient complained before the diagnosis was made, has been seven to nine months. In my series I have many cases in which the symptoms had been present for six months, in some for over a year, and in a few over eighteen months before the condition was suspected. The reason for this of course is that the digestive symptoms are often so vague as to arouse no suspicion. In the main they represent reflex or local phenomena due to stenosis of varying degrees or to ulceration and are usually regarded as simple dyspepsias, mucous colitis, intestinal neurosis, mild attacks of intestinal colic, progressive or periodic constipation, or occasionally even apparent diarrhœa, the latter not very uncommon in large soft ulcerating growths and sometimes being a false diarrhœa due to local irritation but in reality representing progressive obstruction above the lesion.

Some cases begin with an acute obstruction; in some, weeks or months may elapse between the mild or severe obstructive attacks while the general health of the patient may be affected little or not at all for a long period of time

because after all in certain of these cases, notably of the scirrhus type, the symptoms are entirely of mechanical origin not of a toxic origin. In a few cases the symptoms are entirely gastric—anorexia, nausea, vomiting and epigastric distress—notably in caecal neoplasm; while of course these gastric symptoms are present in a marked degree if the obstruction is great. The colon is sometimes considerably distended above the obstruction. Rankin has described three cases of true megacolon. Visible peristalsis is rare; much less than in growths of the small intestine. As a rule, the lower the obstruction, the less marked are the reflex gastric symptoms. Sloughing away of a portion of the growth may relieve the digestive phenomena for a long period of time, while the therapy based on the conception that the symptoms are due to an irritable colon with the inevitable treatment by local heat, antispasmodics, low residue diet and lubrication, unquestionably may delay our diagnosis considerably by the marked temporary relief from such measures. According to Anschütz pain is present in about 63 per cent of the cases, less according to my observation, and usually in the form of intermittent discomfort, which is usually rather diffuse in the lower half of the abdomen, rarely well localized though sometimes especially marked in the umbilical or sacral regions.

Thus the symptoms may be nil, may simulate intestinal or even gastric dyspepsia or mucous colitis, or may be regarded as simple constipation, but, and this is the crux of the situation, the symptoms as a rule come out of the blue. They appear, although sometimes very gradually, without cause; they continue, albeit often with long periods of remission, irrespective of treatment. However, as mentioned before, the appropriate treatment for the suspected condition, especially mucous colitis or constipation—a smooth diet, lubrication, oil by rectum, etc.—often lulls us into a false sense of security by its quick relief of symptoms and often delays our diagnosis; unless, and this should be the invariable rule, we always consider such cases as potentially malignant and with repeated physical

examinations, fluoroscopic and radiographic studies, especially by barium enema, and repeated stool studies we rule out such possibilities. A few cases may present only toxic symptoms. In a few, almost complete obstruction may be the first sign; while in very occasional cases a single large hemorrhage may be practically the only symptom but in the vast majority of cases, probably in 90 per cent or more, the commonplace symptoms mentioned above are found.

We must of course never forget that partial obstruction and ulceration be it tuberculous, benign, or malignant, can give in many respects the same picture. But if such a lesion is demonstrated early, correct diagnosis can usually be made by further tests and surgery can be utilized relatively early.

In the majority of cases diagnosis of colonic neoplasm is ours for the asking if we but suspect its possibility, and yet the average duration of the symptoms has been many months before the true cause has been suspected. Without a suspicion the proper diagnostic procedure is not inaugurated and weeks, months and even a year or more may be wasted before the true condition is determined.

Yet even in the case of these instances of late diagnosis, it is surprising how many are susceptible to surgical treatment because of their lack of tendency to early metastasis. Case after case has come into our Clinic which has been treated for months for nervous indigestion, mucous colitis, dyspepsia and constipation and which proved to be carcinoma of the colon; and yet in the vast majority of such cases they should have been suspected for the symptoms came on without cause and persisted, sometimes with remissions, irrespective of treatment. Pain or discomfort was present in certainly something more than one-half of the cases, and this pain was usually below the umbilicus. Quite a few had epigastric distress. Definitely progressive constipation was the striking symptom in certainly one-half of the cases.

The older laboratory methods, the Kaminer Freund reaction, the increased hemolytic property or anti-trypsin of the serum, Ascoli's surface tension test, the complement fixation test and the finding of specific proteolytic ferments in the blood have no longer a place in diagnosis. They are unreliable and in the main unnecessary, for thorough physical examination, sigmoidoscopic study, examination of the stool for occult blood, and x-ray studies, especially fluoroscopic studies with the barium enema, should and usually do give us our diagnosis.

Of course none of these is infallible. In certain cases differential diagnosis is difficult or impossible. Abdominal palpation is often marvelously aided by examination of the patient in a hot bath. Fecal tumors and the very occasional foreign bodies may sometimes be very deceptive and quite obviously the lower bowel should be thoroughly emptied by euemata, sometimes repeated euemata, before making a diagnosis. A local spasm may show definite defect in the x-ray but belladonna or sodium nitrite and oil instillations usually give us our diagnosis. In some cases the history is characteristic, the tumor may even be palpable but the x-ray show no defect for some tumors in their growth do not constrict the lumen of the gut. A small growth with a slight obstruction in a redundant sigmoid may be very difficult to demonstrate by x-ray study, even by the use of more modern methods, distentions by air, various of the newer opaque mixtures, etc. In a few cases in fact even an exploratory laparotomy and careful palpation has failed to reveal the growth and yet a few months later, the lesion may be palpable, demonstrable and sometimes inoperable.

A tuberculous cæcum may only be differentiated from carcinoma by evidence of tuberculosis elsewhere or by its response to ultra violet light or cod liver oil and fruit juices. Pericæcal inflammation with mucosal ulceration due to an old and forgotten or never recognized appendical attack, especially if the appendix be retrocæcal, may absolutely simulate neoplasm; although as a rule careful

analysis of the history, a leucocyte count, temperature readings, etc. should give us the correct diagnosis.

The reverse is also true and sometimes what was regarded as a cæcal and appendical inflammatory mass proves to be neoplasm. Various inflammatory lesions—diverticulitis, polyposis, localized specific or non-specific ulcerative colitis, and possibly sigmoiditis or perisigmoiditis—may be difficult to differentiate from carcinoma; while tumors of neighboring organs, stomach, liver, ovary, kidney or pancreas may produce very puzzling pictures with persistent defect due to pressure and some obstructive symptoms.

Halstead years ago called attention to the possibility of pancreatic tumors and pancreatitis simulating new growths of the transverse colon. Recently I have seen a case of very rare œdema of the pancreas with mild pancreatitis with marked vascular engorgement, without disturbance of pancreatic function, absolutely simulating such a growth.

Perforation into a neighboring viscus—stomach, vagina or bladder—may blur the picture and arouse suspicion in the secondary and not the primary lesion. I have recently seen three cases of gastrocolic fistula due to colonic new growth where the symptoms were almost entirely gastric, a foul taste, regurgitation of fetid material, etc., and where diagnosis was beautifully shown first by barium enema and then by giving methylene blue solution by rectum, at the same time withdrawing the stomach content by tube.

In rare cases, sarcoma and lymphosarcoma must be differentiated. This is important because these in my experience are practically the only growths susceptible to ray therapy. Finally benign tumors must be eliminated because while they are rare, they are possible, and if associated with ulceration are sometimes very difficult to differentiate; adenomatous polyps, adenofibromata, lipomata, myomata and adenomyomata, angiomata, cystic tumors,

simple polyps, lymphogranulomata, dermoid and echinococcus cysts must be considered.

Careful study of the history, very careful physical examination and the barium enema generally can differentiate these benign neoplasms, but even the barium enema under the fluoroscope, while very valuable is not infallible. It may miss small growths that are present, it may diagnose growths that are absent, and in the difficult cases everything must be utilized to make a diagnosis, history, physical examination, x-ray studies, stool studies, sigmoidoscopic and proctoscopic examinations.

TREATMENT.

As to treatment, I can see nothing but surgery. Colloid selenium, copper and lead have proven singularly ineffective, although occasionally I have felt that the growth has become smaller and the obstructive symptoms less marked after the administration of selenium; although of course this may have been but a coincidence. Deep x-ray and radium therapy have given me no help in carcinoma of the colon except in an occasional colloid growth where an unquestionable arrest, albeit temporary, has occurred. Ray therapy is worth trying however in the rare sarcomata and lymphosarcomata, which are found in about one per cent of malignant growths of the colon, which in certain cases are possibly traumatic in origin and which rarely produce obstructive phenomena but often bleed extensively with a rapid development of anemia.

The surgical mortality is still high, in a recent series being 19 per cent, and some clinicians oppose surgical treatment because of this mortality as this is a disease of older people whose probable life span is not very great and in whom growth is often very slow—cases of four, five, six and even ten years duration having been reported. But I cannot accept this view because to me all these cases are potentially surgical and with early diagnosis and perhaps an ever improving technic, we should get a greater and greater number of permanent cures.

If the case is inoperable or the patients refuse surgical treatment, our treatment must perforce be purely symptomatic—a smooth, a soft and then a liquid diet, with little or no residue, lubricants and simple laxatives, enemata, oil instillations, sedatives and other measures to lessen pain and promote comfort.

As I look back over the years with their many cases of colon malignancy, I am struck by two facts; first, the vagueness of the early symptoms and yet, second, by the possibility of making a much earlier diagnosis in the vast majority of cases if we be suspicious of all symptoms.

In this paper I have touched on some of the means of making an early diagnosis, the methods employed in giving us as complete a picture of the colon and its pathology as is possible. I have laid repeated stress upon the importance of regarding no intestinal symptom which develops *de novo* as insignificant, and have insisted upon the utilization of all means at our command to determine whether the symptom, banal and commonplace though it may seem to be, may possibly represent the first, or at least a very early, symptom of a colonic new growth.

May I therefore end my paper as I began it, with this motif; suspect every digestive symptom in old people, suspect the possibility of new growth, especially if the symptoms do not yield rapidly to symptomatic therapy! For it is the realization of this possibility on the part of the great mass of internists and general practitioners that can give these patients the only treatment that at the present writing affords a real chance of cure and that may spell the difference between potential success and absolute failure.

Even in relatively late cases, it is surprising how good the results are due to the peculiar tendency of many of these growths to metastasize late. It is far better to operate early and occasionally unnecessarily on a well founded suspicion than to delay too long with its inevitable outcome.

THE ROENTGENOLOGIC MANIFESTATIONS AND DIFFERENTIAL DIAGNOSIS OF CARCINOMA OF THE COLON*

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AND

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It is not an exaggeration to say that the roentgen ray has contributed as much to the precise and accurate diagnosis of carcinoma of the colon as it has to the diagnosis of carcinoma of the stomach. The roentgenologic signs of carcinoma of the colon, like those of carcinoma of the stomach, are distinctive and can be elicited not only at the stage when the disease is clinically apparent on account of the ulceration or obstruction which it has produced, but when subjective and objective evidence from other sources is entirely lacking or very indefinite.

In no division of gastro-enterologic roentgenology does the roentgen ray compete with the microscope in making histologic diagnoses. The roentgenologist, however, does not hesitate to exercise his prerogative as a physician to reinforce the visual characteristics of a lesion furnished by his special method of observation with such other features as topical manipulation of the diseased segment might supply. Such are the units of which the roentgenologist's conception of the gross appearance of a lesion is composed. His diagnostic efficiency depends in a large measure on his familiarity with macroscopic pathology, and on the facility with which he is able to correlate the gross pathologic picture with the roentgenologic picture. It is not an idle boast to affirm that the roentgen ray can be made to exhibit a favorable showing in competition with macroscopic examination in the diagnosis of carcinoma of the colon, and in distinguishing it from other lesions of the colon.

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PATHOLOGY

Carcinoma is by far the most commonly encountered malignant lesion of the colon. Sarcoma is seen with extreme rarity. The gross features of a nonepithelial malignant lesion usually bespeak its malignant nature, but a certain diagnosis is possible only after microscopic examination of the tissue.

Rankin classifies carcinomas of the colon morphologically into the following types:

Scirrhus or fibrocarcinoma.—In these tumors there are relatively few carcinoma cells. Fibrous tissue, however, may be so abundant that it is difficult to recognize epithelial cells. Early in its development the tumor consists merely of a small, flat, indurated area in the wall of the bowel. Gradually the intestinal tube is encircled in annular fashion. Stenosis develops with cicatricial contraction of the fibrous tissue. The names “annular” or “napkin-ring” carcinoma are descriptive of its macroscopic appearance. Ulceration is not a prominent feature, hence early in the clinical course blood or mucus is not noted in the stool, and the disease becomes clinically apparent only when obstruction begins to be manifest. As a rule the tumor itself is too small to be palpable through the abdominal wall. The mass sometimes discovered in association with it is usually a collection of scybalous fecal material proximal to the constriction.

Medullary or polypoid carcinoma.—It is important to keep in mind that polypoid tumors, which macroscopically have all the characteristics which we have learned to associate with benign lesions, are not infrequently found on microscopic examination to be malignant. In fact, it is now quite generally believed that medullary or polypoid carcinomas have their beginnings in lesions indistinguishable grossly from the simple and so-called benign polyp. It is therefore to be expected that all stages in the development of a pedunculated or broad-based polypoid tumor to the frank medullary carcinoma with extensive exposed

surfaces will be encountered. Medullary carcinomas are characterized grossly by large, soft, lobulated or cauliflower-like masses projecting into the lumen from the mucosal surface. The margins are irregular, overhanging, elevated; the floor of ulcerated areas is ragged and covered with exudate. Sometimes the intestinal wall does not seem to have been extensively invaded. More commonly, however, mural infiltration is marked and the lesion has the indurated consistence characteristic of malignancy. Necrosis and sloughing of the peripheral proliferative portions of an originally pedunculated polyp result in a flat, saucer-shaped lesion.

Gelatinous (mucoid) carcinoma.—Morphologically, this type of carcinoma of the colon might be looked on as holding a middle ground between the medullary and scirrhus forms. It becomes a circular lesion, enveloping the bowel in annular fashion, but is a much more extensive lesion than the true fibrocarcinoma. In the latter the constricting feature is apparent from both the luminal and serosal aspects. In the former, however, the wall is markedly thickened, heaping up of the malignant tissue having progressed both into and away from the lumen. The luminal aspect of fibrocarcinoma presents a short stricture with little, if any, ulceration. With the colloid type of lesion, however, the channel through the tumor is relatively long, and its luminal surface is denuded and irregular in its course. The tumor is firm and when in a situation accessible to manipulation, may be discovered clinically by the hard mass it presents.

METHODS OF INVESTIGATION

The opaque meal.—The earliest examinations of the large intestine were carried on with the opaque meal. It is now generally agreed, however, that this method is incapable of delivering adequate information regarding organic lesions, although it still has applications in special instances. Its property of becoming dispersed in scattered masses or accumulated in large lumps in separate segments, prevents a satisfactory estimate of the entire colon. Repeated roent-

genoscopic examinations are always required. Further, in the presence of an obstructing lesion, the opaque meal is liable to become impacted above the stenosis. It may thus be responsible for much distress to the patient, and seriously affect the prognosis by becoming the immediate cause of acute intestinal obstruction.

The opaque enema.—Almost all organic diseases of the colon produce deformity in the contours of the lumen of the affected segment. This is particularly true of carcinoma. It follows that the choice of an investigative procedure will devolve on the method which serves best to demonstrate the deformity. The opaque enema is the procedure of maximal efficiency for this purpose.

It is hardly possible to outline the technic of administering the opaque enema without placing emphasis on the necessity of clearing the colon of fecal remnants, gas and fluid before investigation is attempted. This cannot be accomplished without purgation and cleansing enemas. Saline cathartics are ill-advised as purgative agents because they produce their effect by osmotically drawing fluid into the intestinal lumen to the point of maximal distensibility. Evacuation after saline purgation is frequently incomplete and considerable time is usually required for the colon to assume a state of collapse sufficient for satisfactory observation of the opaque enema. On the other hand, purgatives the action of which depends on their property of activating the bowel by severe irritation are likewise undesirable because they are not uniformly efficient, and because of their tendency to leave the colon in such a prolonged state of irritability that retention of the enema becomes extremely difficult or impossible. Castor oil, of all the purgative agents active enough to produce adequate evacuation, is in fact a milder irritant than many others, and we consider it to be the most uniformly efficient purgative agent available for our purposes. The patient to be examined abstains from his evening meal and takes 2 ounces (60 c.c.) of castor oil. The following morning, before the examination, the distal portion of the colon is cleansed with a few normal saline enemas. It is assumed

that the castor oil will have achieved this result in the proximal segments. This procedure usually effects a satisfactory preparation, and the routine is broken only for patients with very severe diarrhea, for those who have a tendency toward severe intestinal hemorrhages, and occasionally for patients with acute or subacute obstruction.

Occasionally a patient experiences undue difficulty in retaining the enema, and sometimes when there is reason to believe that considerable intestinal spasm accompanies the suspected lesion, the administration of an antispasmodic drug often proves helpful. It seems hardly necessary to point out that the drug must be administered to full physiologic effect. Inhalation of amyl nitrite at the time of examination sometimes answers the purpose, but atropine in the form of tincture of belladonna is more efficient and reliable. Sixty drops of the tincture, divided into three equal doses, two of which are taken at an interval of two hours the evening before the examination, and the remaining dose within an hour before the examination, is a dependable form of administration.

Some attention should be devoted to the preparation of the enema itself. Since the roentgenoscopic observation of the opaque enema is the keystone procedure in the roentgenologic examination, the enema must contain a concentration of the basic opaque substance sufficiently high to yield maximal contrast. The opaque material in the enema should be minutely divided, uniformly suspended, and the suspension should be well sustained. Simple suspension in water by agitation is inadequate on account of the rapidity with which the salt is precipitated from such a mixture. Several commercial preparations of barium sulphate are available which are satisfactory in this respect, or a suspending agent, such as gum acacia, may be added to the mixture when it is prepared in the laboratory. The consistence of the suspension should approximate that of heavy cream. It is most important that the temperature of the enema be kept at or slightly above the temperature of the body, because the colon reacts violently at times to the direct application of cold.

With the patient in the recumbent position the enema is administered slowly and steadily, under constant roentgenoscopic observation from the time it enters the rectum until the cecum and terminal coils of ileum are visualized. This is necessary in order to detect abnormalities which may later be hidden by an overlying loop of normal bowel. As the examination progresses the patient is rotated from side to side to obtain views at different angles. These maneuvers, coupled with careful palpatory manipulation, are essential parts of the examination.

Although the roentgenoscopic observation of the opaque enema is the basic and cardinal roentgenologic procedure in the investigation of the colon, it must not be inferred that roentgenography is unnecessary or superfluous. A well executed roentgenogram will often provide invaluable supplementary information which was not so clearly available at the roentgenoscopic examination. On the other hand, the practice of administering the opaque enema, and confining the investigation of the colon to the examination of one or two roentgenograms in different positions is so inadequate that it is mentioned here only in condemnation. Roentgenograms usually are made with the patient in the prone position. It will often be found necessary, however, to place the patient in an unusual position, or to use some form of compression so that the lesion can be projected on the film to best advantage (fig. 1).

Demonstration of mucosal relief.—This relatively new and very interesting method of investigation, sponsored especially by Knothe, Berg, Forssell and others, should be given a place among the valuable diagnostic procedures. Although workers in this field generally advise against the use of purgative agents when this method is employed, the examination of the mucosal relief can be carried on after the evacuation of the enema administered as has been outlined. Essentially the method consists of a study of the relief patterns assumed by the mucosa of the intestine covered with a thin coat of opaque material. The lumen of the colon must be thoroughly cleansed beforehand. The opaque enema is then administered under roentgenoscopic



Fig. 1

Carcinoma (note arrow) involving the descending colon near its juncture with the sigmoid. At the left the lesion is exposed by a slight rotation of the patient to the right and by the overlying loop of transverse colon being separated by the hand of the patient. At the right is the roentgenogram made in the routine manner with the patient in the prone position. A lesion cannot be seen.

control after which the opaque material is evacuated. The mucosal relief is inspected both on the screen and on films. Experience at The Mayo Clinic with this procedure is too limited to permit a reliable opinion about its value. Correct interpretations of these not uncomplicated mucosal states will be born only of judgment acquired by long experience and carefully controlled observations.

The use of gases as contrast substances.—Long before the introduction of inert salts of heavy metals, investigations of the alimentary tract, especially of the stomach and colon, were carried on with the use of gases, chiefly air, as contrast substances. However, they never were universally employed. In special instances, when for some reason the use of opaque salts might be inadvisable or contraindicated, the inert gases may serve a useful purpose. It is possible to obtain a satisfactory outline of the colon by insufflation, but the picture lacks the distinctness necessary for accurate diagnostic work.

Combined methods of examination.—The first method, a combination of the opaque meal and opaque enema, hard-

ly merits the name of a special procedure. It is applied only when the opaque meal has met with an obstruction and the opaque enema is used to determine the distal limits of the stenosis. The warning to exert every effort to prevent a large mass of insoluble and inert material from accumulating proximal to an obstruction bears repetition in a criticism of this practice. The danger of impaction and complete intestinal obstruction can scarcely be over-emphasized.

The second method is a combination of the opaque meal and insufflation. Laurell, in 1921, described a method of examination of the proximal segments of the colon by administering the opaque meal, waiting until such time as the meal was transported to these segments (four to five hours), and insufflating with air. The same objections apply to this method as apply to the opaque meal when used alone. It has not received wide application, and is not nearly as useful as the following method.

The third method is a combination of the opaque enema and insufflation, or the "double contrast" method. Fischer, in 1923, described a method of investigation which will be found to be of greatest value especially for the demonstration of the nondeforming intraluminal lesion of the colon. Essentially the method is an attempt to coat the luminal surface of the bowel with a thin coat of opaque material, and then to distend the lumen with air. It thus provides what is in reality a transparent medium. Weber suggested several technical modifications which he believes makes the "combined method" more readily interpreted, and emphasized the value of stereoroentgenography with the technic. He pointed to the superiority of this method over all others for the demonstration of polypoid lesions and polyposis of the colon, and exhibited lesions not otherwise demonstrable roentgenographically.

The technic may be carried out to good advantage as follows: Complete removal of all solid, fluid, and gaseous accumulations is an unconditional prerequisite. The opaque enema is then administered under roentgenoscopic

control. The colon is filled as rapidly as is compatible with the comfort of the patient and note is made of any abnormalities apparent. When the cecum has been filled the patient is allowed to evacuate the enema as completely as possible, and it is usually found that about the proper amount of the opaque material remains in the lumen of the bowel. No more than a uniform thin coat is desirable. If large collections of the material are still seen after the attempt at evacuation the rectum can be insufflated with a volume of air sufficient to induce a desire for defecation, whereupon the patient will usually return with as near the ideal distribution and concentration of the opaque material as is possible in his case. A hand blower is used for insufflation. The colon is inflated under roentgenoscopic control, and care is exercised not to over-distend any of the segments. The procedure is facilitated by frequent rotation of the patient on the roentgenoscopic table, and by manipulation of the bowel through the abdominal wall. Insufflation carried out in this way has not been in any way more distressing to the patient than might be expected from the administration of the opaque enema.

As soon as the cecum has been moderately distended the enema tip is removed from the rectum and stereoroentgenograms are made with the patient in the prone position. The fluoroscopic image of the air-filled colon lacks sufficient detail to have diagnostic value. The grid diaphragm is of distinct advantage in educing the fine detail requisite for precise demonstration of the anatomic character of the lesions.

This technic is not recommended as a routine procedure. Compared with the barium enema it is cumbersome, relatively expensive, and may offer little additional information especially in those diseases which produce deformity of the lumen. Its greatest advantages lie in its adaptability for demonstrating otherwise obscure, small, nondeforming lesions, and those which may have been clearly and adequately visualized roentgenoscopically, but which are persistently obscured on the roentgenogram by overlying loops filled with dense opaque material. Unquestionably

the method makes a valuable contribution to increased accuracy and general efficiency of diagnosis of diseases of the colon.

ROENTGENOLOGIC SIGNS OF CARCINOMA IN THE COLON

Early carcinoma.—Roentgenologic methods are expected to reflect only the gross anatomic characteristics of pathologic processes. From the histologic studies of Schmieden, Schmieden and Westhues, Doering, FitzGibbon and Rankin, and others, it is known that many polypoid lesions of the colon, benign grossly, are in fact carcinomas. Some of them have a tendency to develop malignant characteristics, and it has been shown very definitely that at least some well-defined malignant growths in the colon have their beginnings in these macroscopically benign polypoid lesions. The earliest stage of a malignant process, then, that the roentgenologic method is likely to uncover, is this type of lesion. The term "polypoid lesion" is used advisedly to include any sessile or pedunculated growth projecting into the intestinal lumen, without special reference to the histologic nature of the tissue of which it is composed. It is not possible accurately to determine the cytology or the malignancy of such lesion without microscopic examination, but adenomas, fibromas, myomas and lipomas are the most common types encountered.

The significant roentgenologic features of these lesions are their intraluminal situation and their prevailing failure to produce a roentgenologically demonstrable deformity in the colonic contour. When these tumors are large and situated in segments accessible to palpation the roentgenoscopic examination will give reliable evidence of their presence. Without palpation a momentary split in the column of the enema as it ascends will most frequently be the only indication of the presence of a polypoid lesion. Approximating the walls of the colon, however, will serve to bring out the characteristic smooth, sharp, evenly rounded or ovoid contours of the central defect. The marginal contours of the colon may be unaffected. The wall of the bowel remains pliant, peristalsis is not hindered,

and only rarely is a mass palpable in association. Ulceration, irregularity of contour of the polypoid lesion itself, evidence of induration or increased local rigidity of the wall of the colon at the site of the lesion, signify infiltration, hence malignancy. Thus it is apparent that the evidence for the presence of these lesions is largely roentgenoscopic. Roentgenography is successful only when conditions are favorable for approximation of the walls of the barium-filled bowel by compression. These considerations apply only to polypoid lesions which are large and which are accessible to manipulation at the time of roentgenoscopy. It is probable that polypoid lesions 2 cm. or less in diameter will almost always elude most careful roentgenoscopy, or will leave the examiner in an insecure state of mind regarding the reliability of his interpretation.

The opaque enema has not produced as reliable and accurate results in the demonstration of polypoid lesions of the colon as the opaque meal has yielded in the demonstration of similar lesions of the stomach. Before the "double contrast" method was available it seemed that the escape of many of these lesions, especially of the smaller ones, from roentgenologic detection, was inevitable. But the use of this roentgenologic procedure has made it possible, not only to detect many more lesions of this type than was previously possible and to project them roentgenographically, but also to complement less decisive roentgenoscopic data with the precise intraluminal picture which the method provides. Polypoid tumors occurring singly or those relatively sparsely distributed, are visualized as rounded, soft projections into the intestinal lumen. Their contours are outlined vividly in the air-distended bowel, and it is possible, when sufficient care has been exercised in carrying out the details of the technic, to determine the character of the surface contours of the growths (fig. 2). Properly applied, the method affords an estimate of the integrity of the interior of the colon attainable by no other method except direct visualization by the proctosigmoidoscope, or surgical or postmortem exploration. Re-



Fig. 2

Elongated polypoid tumor (note arrow) in the descending limb of the splenic flexure. This tumor had escaped roentgenoscopic detection because the involved segment was not accessible to permit approximation of the walls of the colon.

cause the combination of air and a thin coat of opaque material applied to the mucosal surface provides what is essentially a transparent medium, the method is profitably extended to present more clearly a lesion which may have been more or less adequately visualized roentgenoscopically, but which is obstinately obscured in the roentgenogram by overlying loops filled with the dense opaque contrast material of the barium enema.

Mature carcinoma.—Obviously most patients are sent for roentgenologic investigation of the colon when they

have presented a syndrome directly or indirectly referable to a lesion in the colon. When carcinoma is responsible even for vague symptoms it has developed morphologically to the extent that it is not only roentgenologically apparent as a lesion, but, with the exception of the polypoid lesions, its differential characteristics are manifest as well. This observation is based on experience with a considerable number of well-developed malignant lesions discovered roentgenologically in the course of routine examinations, when the expectancy for such discovery was very remote.

The filling defect is the essential roentgenologic sign which must be demonstrated before carcinoma can be diagnosed. The defect is defined as a subtraction from the normal outline of the colonic shadow, and may be central or marginal. It is produced chiefly by protrusion of the growth into the lumen of the bowel, and partly by diminished distensibility of the infiltrated wall. A certain amount of deformity is usually contributed by local spasm. The roentgenologic picture is in fact the shadow of a barium cast made with the lumen of the bowel as the matrix. Hence the filling defect produced by a given lesion will correspond with the luminal contours of the lesion. The extraluminal characteristics of the lesion are discernible only by inference from palpatory manipulation of the diseased area. It follows that the roentgenologic manifestations of carcinoma will vary within certain limits, depending on the morphologic character of the lesion encountered.

The filling defect of the scirrhus or fibrous carcinoma is short, and concentric. Its annular character is its most prominent feature. Ulceration is practically never demonstrable, and fixation to adjacent organs is rare, so that the lesion is uncommonly mobile. The tumor itself is usually so small that it is not palpable. The mass clinically so frequently associated with this type of lesion usually cannot be discovered at the roentgenologic examination if the preliminary preparation has been carried out faithfully. As in all instances of carcinoma, but particularly in this type of lesion, the demonstration of the filling defect is conditioned on the degree of patency of the involved

segment. When the constriction is pervious to the enema, and obstruction of sufficiently high degree exists, dilatation of the intestine proximal to the lesion is apparent (fig. 3). With these small annular lesions complete ob-



Fig. 3
Small annular carcinoma (note arrow) involving the upper portion of the sigmoid.

struction to the enema is most frequently encountered, and the canal of the filling defect is not visualized. In most cases, however, the constriction has permitted the fecal current to pass in the physiologic direction. Retrograde obstruction is caused either by a high-grade diminution

in caliber of the affected segment, or by the establishment of a valve mechanism in which lateral pressure is applied to the constricted area as the medium accumulates under force in the normally distensible bowel immediately adjacent to the lesion. In the former instance the barium column terminates in a conical, usually smooth, although sometimes ragged, projection (fig. 4); in the latter, it terminates in two convex smooth eminences on each side of the central constriction.

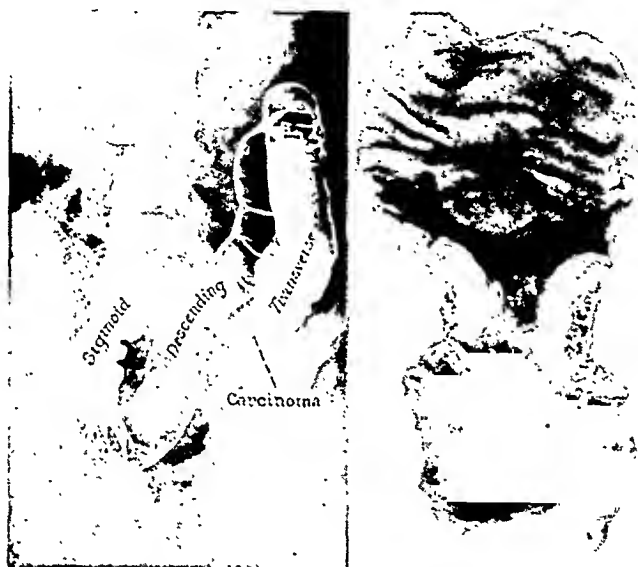


Fig. 4

Annular carcinoma in the transverse limb of the splenic flexure. This lesion produced complete obstruction to the enema and was not pervious to insufflation.

The appearance of the polypoid type of carcinoma varies within wider limits, depending on the size of the growth, the extent of ulceration, and the amount of mural infiltration. Deformity of the luminal contour is not the most striking feature of these lesions. More characteristic is the presence of lobulated, cauliflower-like masses projecting into the lumen (fig. 5). Displacement of the opaque material from their surfaces by approximating the walls of the affected segment with manual pressure presents the characteristic picture. Ulceration is revealed by the mass of opaque medium adhering to the ulcerated floor of the crater which is



Fig. 5

Polypoid lesion (note arrow) involving the ileocecal juncture. Microscopic examination of the resected specimen showed the lesion to be an adenocarcinoma.



Fig. 6

Extensive ulcerating carcinoma in the transverse colon near the splenic flexure.

usually deep and bounded by irregular, overhanging margins (fig. 6). In the cecum and ascending segments of the colon, the polypoid lesion commonly involves only a portion of the circumference; in the narrower, more distal segments, however, the entire circumference is usually included.

The filling defect produced by the third type of carcinoma of the colon is again quite uniform in appearance. The tumor protruding into the lumen of the bowel produces a constriction which is longer in extent than that produced by the annular scirrhus type. The luminal aspect of the tumor is denuded and rough, which is reflected roentgenologically by markedly irregular and jagged contours and the tortuous course of the channel (fig. 7). The demarcation between normal and pathologic tissue is very abrupt, hence the termini of the filling defect have sharp contours, and tend to have a barbed or gnarled appearance. The tumor itself is usually large enough to be palpable through the abdominal wall, and the mass has the indurated knotty consistence associated with malignant tumors. Fixation may be present or absent. Complete or incomplete retrograde obstruction sometimes takes place, usually by the establishment of a valvular mechanism similar to that



Fig. 7

Carcinoma (note arrow) involving the middle segment of the transverse colon. Attention is called to the irregular, jagged contours of the channel and to the abrupt demarcation between normal and pathologic tissue. The specimen was removed at operation.

formed with the short annular lesions. The roentgenologic appearance differs, however, in that the distal terminus of the process is represented as two symmetrically placed sharp prongs to each side of the channel through the tumor.

DIFFERENTIAL DIAGNOSIS

When irregularity in the outline of the colon distended with contrast material is encountered, the first problem is to determine whether the defect observed is real or apparent. Spasm is the one factor which is operative in producing distortion in the contour of the colon which is not real, although the appearance may simulate closely that of a genuine intrinsic lesion. Spastic filling defects often show their true character by changing their form or situation. At times, however, they may persist unchanged for a considerable period. Manipulation of the involved segment sometimes effaces them; often they are absent at the second examination. The effective use of antispasmodic drugs, however, is the most satisfactory method of determining the amount of spasticity operative in producing a given deformity. Not infrequently gross deformities in the outline of the colon are produced by acute or fulminating inflammatory processes in adjacent or contiguous organs. This is due either to an extension of the inflammation to the serosal surface of bowel, or to reflex spasm. At times the spasm is so marked that the lumen of the bowel is closed completely. Such a filling defect is distinguished from one due to an intrinsic lesion by the notation that it usually involves a relatively long segment, that its outline changes its form during the examination, and that evidence of mucosal change is absent. Localized areas of spasm are also encountered which are apparently reflex from acute or subacute inflammatory lesions in abdominal organs distant from the area of spasm.

Other causes of apparent rather than real filling defects are local accumulations of gas, fluid and fecal matter in the colon. These can usually be displaced by palpation during the roentgenoscopic examination, and they do not have a constant outline. Irregularities in outline caused

by pressure from other organs such as the spleen and gall-bladder, from extrinsic tumors and from adjacent bony parts are readily distinguished from true filling defects by determining their extrinsic situation during the roentgenoscopic examination.

Carcinoma is not the only intrinsic disease of the colon which is manifested by the filling defect. Other tumefactive processes which produce localized deformities in the outline of the colon are diverticulitis, specific and non-specific granulomatous lesions and benign organic strictures.

Diverticulitis is encountered practically only in the segment of the sigmoid. The filling defect produced by this disease is the result both of spasm, which may be so marked as to produce complete occlusion of lumen, and of the encroachment of the pericolic inflammatory tissue on the lumen of the bowel. It is usually possible to visualize diverticula in the more proximal uninvolved segments as rounded, knob-like projections from the lumen of the colon. Differential diagnostic points are the concentric serrated contours of the affected segment contrasted with the sharply irregular and eccentric contours of carcinoma, the maintenance of flexibility in the former compared with the stark rigidity in the latter, and the long segment involved with diverticulitis as opposed to the relatively short segment which carcinoma usually occupies (fig. 8).

Hyperplastic tuberculosis, amebic granuloma, and the mycotic affections of the bowel, named in the order of frequency of occurrence, are grouped together under the general term "specific granulomas." They are much more readily distinguished from carcinoma than they are from each other and from nonspecific granulomatous lesions. They are preeminently diseases of the "cecocolon," although nonspecific granulomas and the mycotic lesions, and less frequently hyperplastic tuberculosis, are encountered in other segments, especially in the sigmoid. The principal differential characteristic which all of these lesions possess in common is the length of the segment which



Fig. 8

Diverticulitis involving a long segment of the proximal sigmoid colon. The serrated contours and the presence of other diverticula in the more proximal segments may be seen.

they encompass in their involvement. The demarcation between the normal and the pathologic is gradual rather than abrupt, the channel of the filling defect is concentrically placed, tends to have a smooth outline, or if irregularities in contour are present, they are rounded and bulbous rather than jagged and angular. When a mass is palpable with these lesions it does not have the indurated consistence of malignancy, but is boggier and more dough-like. The lesions usually are fixed, but pliable.

Quite rarely chronic ulcerative colitis, specific or non-specific, involves only a localized, short segment of the colon. An abrupt narrowing may be produced by such processes, and the moth-eaten appearance of the channel

makes the lesion bear a strong resemblance to carcinoma. The divergence of the therapeutic procedure which hinges on the diagnostic decision makes the differentiation highly significant. This type of lesion usually shows marked irritability; its channel is relatively broad, its margins smooth, and the lesion is pliable in spite of the marked localized mural thickening.

Organic stricture is exceedingly uncommon except as a complication of chronic ulcerative colitis. A short segment is usually involved, but the narrowing is spindle-shaped, the lesion is pliable, and has a smooth and regular outline (fig. 9).

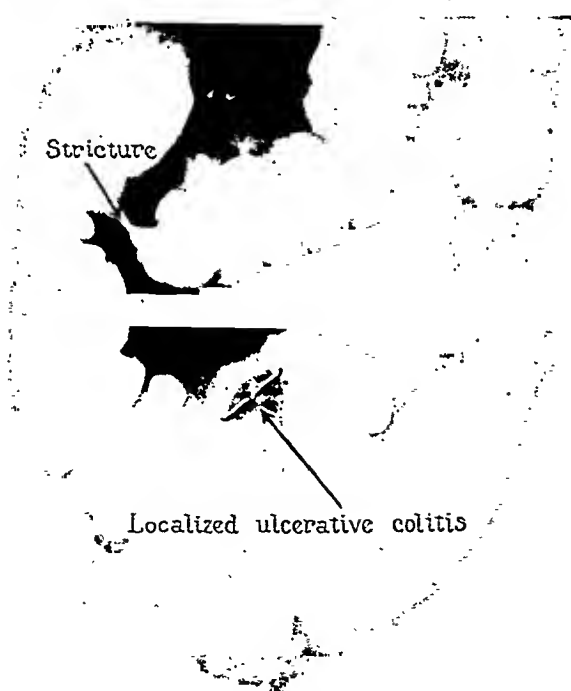


Fig. 9

Organic stricture in the transverse colon near the splenic flexure. The narrowing is spindle-shaped and the outline is smooth. The filling defect in the sigmoid was found at exploration to be an active area of chronic ulcerative colitis.

Occasionally tumefactions extrinsic to the colon produce constriction of its lumen by completely or incompletely encircling it. Pelvic tumors and masses of metastatic nodes in the abdomen have been responsible for such localized encroachments on the lumen of the colon in our experience. In spite of the marked constriction, evidence of obstruction was entirely absent in the cases of this type which we have examined. The defect, however, has none of the characteristics which we have learned to associate with malignancy.

The roentgenologic profession points with just pride to the contribution its special method of observation has made to the diagnosis of carcinoma of the stomach. Contribution to the diagnosis of carcinoma of the colon is equally gratifying, and equally important, for 10 per cent of all malignant lesions which occur in the gastro-intestinal tract occur in the large intestine or rectum. Success in the treatment of patients affected with carcinoma of the colon may be expected to advance hand in hand with the development of refinements in diagnostic methods. It is probable that a great many of the failures in treatment are attributable primarily to the late stage at which the lesion was recognized. Roentgenologic methods make it possible to recognize carcinoma in its early stages, often before there is adequate clinical evidence for suspecting its presence. The message is obvious. The disease must be recognized earlier to permit the earliest possible institution of proper therapeutic procedures. Any changes in intestinal habit, evidenced by irritability, mucous diarrhea, alternating periods of constipation, localized pain and tenderness which do not tend to disappear, not to mention tumefaction, anemia, and obstruction, all are indications for a most thorough-going roentgenologic investigation of the intestinal tract. It is not out of place to recommend that this investigation be included in the routine yearly examinations. Such measures are necessary to increase the operability of the malignant lesions encountered, and simultaneously will offer much more reasonable hope for satisfactory end results.

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SURGICAL ASPECTS OF CARCINOMA OF THE COLON*

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Given accurate localization and a relatively correct pathologic diagnosis of a malignant lesion of the large bowel, the evolution of surgical measures indubitably has made radical extirpation the present-day choice of treatment. A surgeon's questions to himself, when confronted with such a situation, are: when is the optimal time for exploration, and if the condition is found operable at exploration, what type of maneuver offers the lowest surgical mortality compatible with widespread extirpation of the growth contiguous tissues? In general, it may be said that carcinoma of the colon, as it usually presents itself, is rarely to be considered an emergency problem. In The Mayo Clinic, probably 5 per cent, or certainly very little more than this proportion of cases, is encountered giving the picture of acute intestinal obstruction. That this is not true in larger communities I am well aware, but certainly the relative number of carcinomas of the colon which produce acute intestinal obstruction in any community is an insignificant one, compared to the whole. Burgess, reviewing a large series of cases of intestinal obstruction in his hospital in Manchester, England, called attention to the fact that one-third of all cases of intestinal obstruction result from acute stenosis of the large bowel and further postulated that if one can exclude hernia and intussusception and localize the lesion to the colon, the chances are nine to one that malignancy will be found to be the cause. One might add further that almost invariably the malignant growth is situated in the left portion of the colon, and more often than not, at or near the rectosigmoid juncture.

However, it is with the larger group, that of chronic and subacute obstruction, that I am most concerned. It is relatively correct to estimate that 75 or 80 per cent of

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all patients with carcinomas of the colon, as they present themselves in the routine of work, have some form of intestinal obstruction, usually chronic, occasionally subacute, and less frequently, acute. This is true of lesions of the left half of the colon, beyond the middle of the transverse segment, for two reasons: (1) the type of growth in this section of the bowel is encircling, usually scirrhus, and tends slowly to cause stenosis of the bowel by encroachment on its lumen, and (2) the fecal content of this segment of the bowel, which is a storehouse and has little physiologic function, is hard and formed, the combination making an ideal situation for obstruction. In the right half of the colon obstruction is rare, and here the preliminary measures indicated for rehabilitation are instituted to combat anemia and toxemia, rather than the dehydration, debilitation, and starvation of obstruction. In addition to obstruction, there is present in practically all cases of carcinoma of the large bowel, as in carcinoma elsewhere, a subtle undermining of the patient's resistance, the explanation of which I am not prepared to offer, but it is certain that the very presence of a malignant lesion unquestionably produces a deleterious effect on the physiologic state and lowers resistance to secondary infection which may or may not follow surgical insult. Perhaps it may be explained, in a general way, by assuming that chronic obstruction produces in a less emphatic way the deleterious products so fulminantly characteristic of acute obstruction, namely, the toxemia and starvation which are emphasized by changes in chemical elements of the blood, and general decrease in vitality.

The time at which exploration should be undertaken, then, depends largely on the amount of obstruction present in the individual case, if the general condition of the patient makes it reasonable, before operation, to assume that the growth has not spread beyond its local confines. A period of preoperative preparation is always desirable; it always increases the individual's chances for successful operation, and should, I firmly believe, be a distinct part of the surgical attack. This preliminary treatment per-

mits one to decompress the colon by medical or surgical means and, at the same time, to institute measures for increasing the patient's resistance to infection which may follow. It has been my custom in all of the cases in which acute obstruction is not present, to hospitalize the patients over a period of four to five days or even longer, during which time repeated flushings by enemas, coupled with mild purgation by preparations of senna, have rid the bowel of its content and have lessened some of the local infection around the growth. At the same time the patient has been placed on a residue-free diet and efforts to increase hydration and overcome inanition, desiccation and starvation, by forcing large amounts of fluids, or by blood transfusion if necessary, have been carried out. The optimal time, then, at which one seeks to attack carcinoma of the colon surgically, is when successful medical decompression has reduced the colon to a state as nearly comparable to that of the normal colon as is possible in the face of malignancy, and at the same time, has increased, by measures of rehabilitation, the physiologic status of the patient to as nearly a normal one as may be possible.

As to the method and time of decompression, I would make myself plain. In the first place, I take it that no one will attempt to decompress an acutely obstructed colon by other than surgical methods. To do so is folly and, from the patient's standpoint, fatal. It is well known, however, that subacute intestinal obstruction, which is confined to the large bowel, is well tolerated over a period of several days without changes in chemical constituents of the blood, and without the fatal prognosis so well recognized in cases of obstruction of the small bowel. Confronted with a distended abdomen, vomiting of content of the small bowel, and other signs of acute intestinal obstruction, I take it that no surgeon, or even operator, would be so unwise as to delay introduction of a drainage tube into the bowel by surgical measures. However, in the case of moderate, subacute obstruction, or of chronic obstruction, one need not fear to attempt to relieve the bowel of its content by repeated enemas and mild purgation, and if persisted in

over a period of time and watchfully carried out, such measures not only will prevent the production of acute intestinal obstruction, but will, in the majority of cases, relieve the impending obstruction and return the bowel to a relatively normal state.

When the abdomen is explored, and operative intervention is undertaken, it is highly desirable that the bowel be flat and unobstructed, and that the infection around the growth be reduced to a minimal amount. Herrmann has shown very pointedly that obstruction of the large bowel which is accompanied by an ulcerating lesion produces a condition which increases enormously the permeability of the colonic wall, and thus permits extravasation of organisms out into the pericolonic tissues. For this reason, I think, more than for any other, the spread of peritonitis which sometimes follows colonic resection may be attributable to exploration and manipulation of the growth, rather than to leakage at suture lines, or to other technical failure.

Rehabilitation follows decompression in direct sequence, and is accomplished, as I have said, by adequate hydration, blood transfusion, and attempts to increase the normal elimination and to build up the general status of the individual as much as possible over a short period of time. As a further step at increasing the protection of the patient following operation, I have found it desirable to employ, as a routine, an intraperitoneal vaccine made of streptococci and colon bacilli derived from patients who have succumbed to peritonitis. I am confident that this procedure has been advantageous. We have now used it in more than 800 cases in the last four years and are impressed with the fact that, as one measure in the sequence of factors of safety, it has proved its worth. The procedure is a logical one in the efforts to increase the patient's resistance, and, in conjunction with other measures it is desirable. The vaccine is employed as a routine before operation, being given three days prior to the resection. Usually, its administration is accompanied by a general reaction which is characterized by malaise, headache, ele-

vated temperature, and elevated pulse rate. This subsides at the end of twenty to twenty-four hours.

As an evidence of what may be expected of intraperitoneal vaccine, I refer to a preliminary report made on its use in 1928. During that year sixty cases were reported from the clinic in which operation was performed for carcinoma of the colon, with a mortality rate of 5 per cent, whereas in a controlled group of sixty cases, with identical lesions; the mortality rate was 23 per cent. That this huge reduction of mortality was certainly not entirely due to the vaccine, I am convinced; but as one of a series of factors aimed at increasing the safety of the patient against infection, I believe it was an important one. In 1931, with Bagen, I reported 222 cases of carcinoma of the colon and rectum in which vaccine was used between January 1 and October 1, 1929, and fifty-eight cases in which operation was done during the course of these months for similar conditions, but without vaccine. Eleven deaths occurred from peritonitis among the 222 cases, representing a mortality rate of 4.9 per cent, whereas in the fifty-eight cases in which vaccine was not given, there were thirteen deaths from peritonitis (22.4 per cent).

The answer to the second question, as to the type of operation by which the growth and its contiguous tissue can be removed with the lowest mortality, is governed by certain principles of physiology and surgery which I think are incontestable. When one remembers that the large bowel is a bifunctional organ, that the right half of the colon is the absorptive portion, that the left half is the storehouse, and that infection from the normal bacterial content of the intestine is ever present, it is obvious immediately that the most meticulous care the surgeon can exercise to guard against subsequent peritonitis, which is the greatest lethal factor, at the same time being enabled to remove as widely as possible node-bearing tissue with the growth, is exceedingly desirable.

The choice of operation in the two halves of the large bowel differs materially and is influenced by a number of factors: (1) obstruction; (2) the nature of the pathologic

process present; (3) the presence or absence of local metastasis, and (4) local fixation and attachment of the growth. Always, if obstruction and dehydration are present, they must be combated, the patient's resistance against infection elevated, and the ability of each patient to withstand just as formidable an extirpative procedure as is possible must be estimated. In the main, it may be emphasized that: (1) decompression, (2) rehabilitation, and (3) graded operations, are the three important principles to be followed, with slight deviation.

Unquestionably, operations for carcinoma of the colon, in the majority of instances, should be performed in multiple stages. Not only does a drainage operation or a side-tracking operation for growths in the right half of the colon reduce the infection around the growth and permit the patient's resistance to be built up for a subsequent, formidable extirpative maneuver, but it simplifies the secondary procedure and frequently allows one to undertake massive resections at the second stage, which were adjudged inopportune at the primary exploration. It has been my practice in recent years to attack practically all carcinomas of both sides of the colon by multiple maneuvers. In the right half of the colon the operation of choice, I believe, is ileocolostomy performed in whatever manner you will, so long as anastomosis is made end-to-side, rather than lateral and followed by resection at a later operation. In the left half of the colon obstructive resection, which is a radical procedure, is the operation of choice in cases in which measures of decompression have been carried out. In cases in which obstruction is unrelievable by measures of decompression, drainage by cecostomy or colostomy, to be followed by subsequent resection and anastomosis, answers the purpose. In any type of operation, it is my custom to make the exploration at the preliminary stage. The exploration should always be carried out in a routine manner in which one examines first the liver, then the aortic nodes, then the nodes in the bifurcation of the iliac vessels, then the bottom of the pelvis and, finally, the growth itself. Gentle manipulation of the

growth, touching it most gingerly and obtaining from this gentle touch some idea as to its mobility and resectability, as well as knowledge of invasion of the local nodes, is highly desirable. The spread of infection not only is brought about by manipulation, but sometimes an unsuspected abscess around the cecum, or an unsuspected abscess of complicated diverticulitis may be opened by the exploring finger when least expected. There is no necessity to repeat the exploration at the second stage of the operation, and consequently less of the peritoneal cavity is exposed to contamination.

In resection of the right half of the colon, I prefer to make the anastomosis end-to-side, over a clamp which I have devised to do this aseptically, and then wait for a period of about four weeks, or even longer occasionally, to do the resection. During this time the local condition almost uniformly is improved by reducing the infection around it, and the patient has not only increased his resistance to the infection, but the whole risk of operation is materially reduced. I emphasize the end-to-side anastomosis, rather than the lateral, because I think it is impossible to divert the fecal stream by the lateral anastomosis, and since this is the most important feature of a graded maneuver, I believe nature's method of end-to-side juncture, as at the ileocecal valve, is much preferable. Although the general rule of performing operations on the right portion of the colon in multiple stages is a good one to which to adhere, there unquestionably is a certain number of cases in which the growth is small, there is no adhesion to the lateral parietal peritoneum and adjacent viscera, and the patient's general condition is such that resection in one-stage is desirable. Perhaps 25 to 30 per cent of cases of carcinoma of the right half of the colon, if diagnosed in their earlier stages, may be treated in this manner, but if one desires to do an operation in a single stage, I think it is imperative in each case that decompression be carried out by enterostomy in which the stoma is made in the terminal part of the ileum. This permits one to relieve gas pressure and tension on the suture line, and assists mater-

ially in healing. The increase in time allowed to elapse between stages in operating on either the right or left half of the colon, in my service, has been a successful innovation. Previous to the last two years, I have been accustomed to perform the second stage of the procedure in two weeks, or three at most, unless the patient constituted a poor risk, and this, I think, frequently was an unhappy practice. The custom of allowing a longer period of time between stages is vulnerable from the standpoint of spread of malignancy, and yet, when one considers that patients with carcinoma of the colon, as they are seen at the clinic, have had symptoms for an average of ten and a half months prior to operation, one can find small room for condemnation of waiting another month or five weeks after the preliminary stage of the operation, if by doing so more patients out of 100 may be submitted to resection. The second stage resection, is a comparatively simple one after ileocolostomy, and consists of mobilization of the right half of the colon by dividing the lateral parietal peritoneum, rotating mesially the whole growth, with its node-bearing tissue and retroperitoneal fat, dividing the bowel above the anastomosis, and peritonizing the raw surfaces encountered. Because, retroperitoneally, there is a pocket and large amount of raw surface which collects serum, it has been my practice to employ drainage in this space, and I have no reason to regret it.

If the growth is situated beyond the hepatic flexure, or more accurately, beyond the middle of the transverse colon, down as far as the juncture of the middle and lower thirds of the sigmoid, it is preferable to remove the invaded segment of bowel at one stage by an obstructive type of resection in every case in which chronic or subacute obstruction may be eliminated by preoperative precautions. This type of procedure, which utilizes all of the satisfactory fundamental principles of the Mikulicz operation and avoids most of its disadvantages, is the most satisfactory in my hands for removal of all mobile segments of the large bowel. By mobilizing the bowel accurately, ligating the blood supply close to the mesentery, and removing all of the nodes

and node-bearing tissues in the immediate vicinity of the growth, it is just as radical a resection as can be carried out by any type of surgical procedure. One may, after removal of the bowel, make sure by visual inspection that the blood supply to its two ends is sufficient. A clamp is left on the two ends of the bowel, and the toilet of the peritoneum is completed, leaving the colon totally obstructed for a period of forty-eight to sixty hours. At the end of this time, the proximal blade of the clamp is released and pressure of gas blows open the end of the colon, decompressing it immediately. The subsequent steps of the operation are completed exactly as in the old Mikulicz procedure. It is a rule that most of these wounds heal spontaneously at the end of two months, if enough spur has been removed between the two stomas, and pouting mucous membrane has not been left attached to the skin.

I would not be misunderstood as totally condemning the Mikulicz operation, for I believe it has an occasional indication, even today, but its indications are so limited and so accurate that as a routine I think it can be almost completely abandoned. Sistrunk, a few years ago, pointed out very accurately the indications for it, and in giving the contraindications, practically eliminated the operation as one of the useful surgical procedures. That is, in cases of adherent growths associated with infection of the wall of the bowel and adjacent tissues; for large growths associated with infection, or obstruction, and for growths in the sigmoid with short mesentery in obese patients with thick abdominal walls, it could not be used. Even casual inspection of this list of contraindications makes it perfectly apparent that there are few situations in which the operation can be employed. I think its most definite indication is in a case somewhat as follows: an elderly, thin, dehydrated, desiccated patient, who is without obstruction, but who is host to a carcinoma of the sigmoid or transverse colon, and who is physically unable to withstand any procedure of moment. On opening the abdomen, under local anesthesia, one finds in the mobile colon a small, scirrhous, encircling growth. The bowel is brought

out on the abdominal wall, and the wound is closed insecurely around it. In such an instance, when further operation would be judged extremely dangerous, such a procedure is desirable. There are a few cases of growths in the left side of the colon, which, because of the type of obstruction present, do not respond to medical decompressive measures, and although there is no evidence of obstruction previously, when the abdomen is opened a thickened and somewhat distended colon is found. In such a situation, I should unquestionably hesitate to advocate any type of resection without preliminary decompression. Such decompression can be carried out either by cecostomy or by colostomy applied above the growth and resection delayed to a more favorable time.

The advantages of cecostomy preliminary to resection of the colon and rectum have been emphasized recently by Whipple in a most illuminating article. He emphasized the work of numerous investigators who have measured the rates of healing of various tissues and called attention to the "lag" period and the first days of fibroplasia of the colon, which are of utmost importance. Up to the fourth day of repair following anastomosis, the cut ends of the bowel are held together by some suture material or mechanical appliance. During this period there is rapid formation of fibrinous exudate, which builds up a barrier to infection until the process of fibroplasia has united the edges of the wound and epithelium has covered the defect. Obviously, during this period, when healing is taking place and apposition at the line of suture is weakest, increased peristaltic action causes distention against the line of suture. The blood supply of the colon which also is scanty, as compared to that of the small bowel and stomach, does not make for rapid healing in the face of infection and, consequently, necrosis at the line of suture, and leakage, occasionally are directly the result of inadequate vascularization. Therefore, as Whipple wrote, the advantages of cecostomy, and one might likewise add colostomy, for the maneuvers accomplish the same thing, are about as follows: (1) It makes possible proper cleansing of the colon

before resection; (2) it permits the part anastomosed to be at rest until the period of fibroplasia is complete; (3) it increases the comfort of the patient by reducing distention and pains of ineffectual peristalsis; (4) it obviates the temptation and the necessity in some cases of giving enemas and irrigations in the critical period of repair; and (5) in cases of partial or complete obstruction of the colon and rectum, it has long been recognized as essential, and if it works so well for patients who are desperately sick, it is even more efficacious in the case without obstruction. Although I prefer colostomy to cecostomy in growths of the left half of the colon, I am heartily in accord with the principles as laid down, and feel that the advantages of decompression are so manifest that there is small question that such a measure is desirable.

One might say of the advantages and disadvantages of technical evolutions applied to the left half of the colon, that rarely, if ever, should primary resection and anastomosis by suture or mechanical appliance be attempted in this arm of the bowel. Occasionally, primary resection and anastomosis will be successful, but usually it is so dangerous and so likely to be followed by untoward complications that I feel its employment at all is distinctly hazardous. Certainly, decompression should follow the primary anastomosis if it is done at all, but for all practical purposes I feel it should almost never be attempted. I believe, undoubtedly, that operations in multiple stages on this half of the colon are infinitely superior to any type of primary anastomosis, infinitely safer, and more surgically correct.

Postoperatively, I have found it highly desirable to adhere to a most systematic and rigid regimen for patients who have been submitted to resection of the colon. In this regimen is incorporated total abstinence from food or liquids by mouth or bowel. Hydration is accomplished by intravenous and subcutaneous introduction of saline and glucose solutions and recently, following the suggestion of Miles, we have come more and more to the use of blood transfusion after extirpative measures on the large bowel

and rectum. Morphine in adequate amounts to still peristalsis and relieve pain is an anchor to windward after these operations. These and supportive measures over the first five days of convalescence are done as a routine in my service.

Statistics of operability and mortality in surgery of the colon and major surgery of the rectum are inextricably joined. The vague term "operability" has so many shades of meaning to different surgeons that it is only with great difficulty that one arrives at a satisfactory comparison of types of cases which are suitable for resection in the hands of different men. What may be judged removable in the hands of one man is considered inoperable in the hands of another, and yet, the crux of the situation, in arriving at the number of patients cured by surgical methods is that a high standard of operability must be maintained, rather than a low and satisfactory standard of hospital mortality. The usual standards by which one judges operability are: (1) the question as to whether the growth has metastasized to the liver; (2) whether there is lymphatic involvement; (3) whether local fixation to adjacent viscera or the abdominal wall precludes extirpation, and (4) whether the general resistance of the host has declined to such a point that removal is deemed inadvisable from this standpoint. Certainly, small objection will be made in the majority of instances to a surgeon's refusal to resect a colonic carcinoma because of hepatic metastasis. However, one occasionally is justified, I believe, in doing a palliative type of resection in the face of metastasis to the liver, when the growth can be removed with comparatively little danger by some simple technic. This maneuver, although it necessarily can be applied to only a very small group of patients, does give comfort to some, and for that reason is justifiable occasionally. People dying from carcinoma of the liver have a relatively painless and not too uncomfortable demise, whereas if the local lesion is irremovable, it progresses, the ulceration extends, more tissue, adjacent viscera and nerves are involved, and the ultimate outcome is inadequately described by any vocabulary. As to local fixa-

tion and lymphatic involvement, one is not justified, I think, in refusing operation to a patient with carcinoma of the colon because of involvement of the lymphatic structures in immediate juxtaposition to the growth. Likewise, the knowledge that one is unable, by visual examination and by palpation, to tell, in the average case, whether the lymphatic nodes are involved, without removal of one or more for microscopic examination, emphasizes the fact that local lymphatic enlargement is no criterion of operability. To contract the horizon of operability is to improve the hospital mortality but is, I believe, a totally unjustifiable position in dealing with colonic carcinomas which are not amenable to other therapeutic measures than surgery. It is my conviction that borderline cases, or even some cases which are beyond the borderline, should be accepted for resection when there is no evidence of metastasis to the liver, and when the patient is given a chance of recovery, albeit a small one at high operative risk. Certainly, in dealing with intra-abdominal carcinoma, one has no better criterion of operability by which to proceed than to imagine oneself in the place of the patient. Who is there who would not choose a massive resection, even in the face of an obviously high risk?

Fortunately, mortality statistics have been gradually revised downward during the last ten years in this field of surgery, and yet much is still to be desired. I do not believe that one can ever hope to attain the low mortality in dealing with gastro-intestinal carcinoma that one finds in surgical operations for chronic benign ailments. Indeed, I am in complete accord with the view which W. J. Mayo pronounced many years ago; that when his hospital mortality in cases of carcinoma of the colon and rectum descended below 10 per cent, he began to suspect that he was not operating on a great many patients who deserved resection.

During the last three years in The Mayo Clinic, we have, by cooperative management, succeeded in lowering the hospital mortality rate while, at the same time, the curve of operability has been extended. In 1930, the operability was 57.5 per cent; in 1931, it was 56 per cent. The death

rate was reduced to 10.9 per cent in 1930 in a series of 712 operations for organic lesions of the colon and rectum, 68 per cent of which were carcinomatous; the majority of the remainder were either tuberculous or fecal fistulas, and equally as high risk from the standpoint of resection. In 1931, the mortality rate in 719 operations was 9.1 per cent. The same type of lesions predominated here as in the preceding years.

Undeniably, more patients with carcinoma of the large bowel and rectum are appearing at an earlier stage, and yet there is much to be desired in advancing the time of operation. In The Mayo Clinic, the average patient with carcinoma of the large bowel who presents himself for examination has known of symptoms for ten and a half months, striking testimony to an unsuccessful attempt to educate laymen with regard to the obscure symptoms of organic lesions of the gastro-intestinal tract. It is not too much to hope, however, that with increased roentgenologic efficiency in diagnosis of diseases of the colon, with a better understanding of symptoms, and with more coordinated efforts on the part of the medical profession to advance diagnostic methods, that earlier diagnosis will result, and radical extirpation will be followed by more satisfactory end results.



QUALIFICATION FOR FELLOWSHIP IN THE SECTIONS

All of the Sections concerned have expressed approval of the requirements for Fellowship in Sections as agreed upon at the meeting of the Committee on Classification of Fellows with officers of Sections held March 15, 1932.

The proposals will be incorporated into a revision of the By-Laws of the Academy which is about to be undertaken.

The requirements are as follows:

In addition to the requirements for membership in the Academy—

1. Certification by the American Board of Ophthalmology, American Board of Otolaryngology, American Board of Obstetrics and Gynecology, or other national board maintaining equal standards, *or*
2. Award by an approved university of an advanced degree in the specialty together with a period of special practice to make up a total of at least five years work in the specialty, *or*
3. An approved residency or special internship of a minimum of 2 years duration, with a satisfactory amount of basic science work and a period of special practice to make up a total of at least five years work in the specialty, *or*
4. Five years of experience and training in special practice of a character which has met the approval of the section concerned, *or*
5. Qualification by reason of distinguished professional service and standing and at least 10 years in practice, *or*
6. For those not engaged in clinical practice, an equivalent experience and training in a teaching, research or other non-clinical medical field.

FIFTH ANNUAL GRADUATE FORTNIGHT

A Postgraduate Two Weeks Devoted to Neoplastic Diseases

OCTOBER 17 to 28, 1932

TUMORS

The Program Comprises

HOSPITAL CLINICS, EVENING MEETINGS, AND A
SCIENTIFIC EXHIBIT

I. HOSPITAL CLINICS

Afternoon clinical programs will be presented in eighteen of New York's leading hospitals. Among the clinicians who will participate are:

F. E. Adair	J. F. Erdmann	I. Kaplan	W. Martin	B. Samuels
F. M. Allen	L. K. P. Farrar	E. L. Kellogg	F. S. Mathews	H. F. Shattuck
J. B. Amberson	H. Fischer	F. Kennedy	H. W. Meyer	DeW. Stetten
G. C. Andrews	M. Fishberg	J. D. Kernan	W. H. Meyer	A. R. Stevens
F. W. Bancroft	R. T. Frank	M. Keschner	P. W. Nathan	G. D. Stewart
B. S. Barringer	E. D. Friedman	L. Kessel	H. Neuhof	A. Stillman, 2d
A. A. Berg	L. F. Frissell	P. Klemperer	G. G. Ornstein	B. Stookey
J. C. Bloodgood	J. C. A. Gerster	F. H. Lahey	A. T. Osgood	D. Symmers
R. E. Buckley	J. H. Globus	A. Lambert	W. W. Palmer	F. Tilney
H. W. Cave	R. Golden	B. J. Lee	O. Pickhardt	J. J. Valentine
C. G. Coakley	P. S. Goodhart	D. Lewis	A. Plaut	W. W. Weeks
M. Cohen	W. P. Healy	E. Libman	R. E. Pound	H. Wessler
W. B. Coley	C. G. Heyd	H. H. M. Lyle	D. Quick	A. O. Whipple
B. B. Crohn	I. S. Hirsch	J. M. Lynch	H. A. Riley	W. C. White
W. T. Dannreuther	F. C. Holden	G. M. MacKee	G. A. Robinson	F. C. Wood
G. S. Dudley	C. J. Imperatori	W. J. MacNeal	I. Rubin	A. M. Wright
C. A. Elsberg	L. Jaches	D. Marine	F. B. St. John	F. C. Yeomans

II. EVENING SESSIONS

The subjects and speakers at Academy meetings will be:

The history of cancer.....	Henry E. Sigerist
Cancer research.....	Francis Carter Wood
The factors constituting malignancy and tumors.....	James Ewing
The consecutive clinical and pathological events in cancer	Harrison S. Martland
The importance of statistics in cancer control.....	Louis I. Dublin
Tumors of the brain.....	Charles A. Elsberg
Tumors of optic chiasm and optic tract	Harvey Cushing

Tumors of the eye and orbit.....	W. Gordon M. Byers
Cholesteatoma	Samuel J. Kopetzky
Tumors of the spinal cord.....	Byron Stookey
Tumors of the nerves.....	Dean Lewis
Tumors of the pleura and lungs	George J. Heuer, James Alex. Miller
Tumors of the bladder.....	Edwin Beer
Malignancies of the prostate.....	Joseph F. McCarthy
Cancer of the uterus.....	George Gray Ward
Fibroids and adenomata.....	Thomas S. Cullen
Tumors complicating pregnancy.....	Benjamin P. Watson
Cancer of the stomach.....	Donald C. Balfour
Tumors of the colon and rectum.....	Daniel F. Jones
Tumors of the mouth and tongue.....	Carl Eggers
Tumors of bones and allied structures ..	James M. Hitzrot, R. E. Herendeen
Tumors of the skin and mucous membranes	A. Benson Cannon
Hodgkin's disease and lymphadenomata.....	Lloyd F. Craver

III. SCIENTIFIC EXHIBIT

Concurrent with the Fortnight, and for an added week thereafter, there will be housed in the Academy building an exhibition numbering approximately 3000 units. A number of the sections in the exhibition will be subjected to lecture demonstrations at regular intervals.

No fees will be charged for attendance at any of the clinics or meetings on the program.

A COMPLETE PROGRAM AND REGISTRATION BLANK FOR
CLINICS AND DEMONSTRATIONS WILL BE MAILED
ON REQUEST

DIRECTORY OF QUALIFIED OCCUPATIONAL THERAPISTS

The American Occupational Therapy Association has just issued its first Annual Directory of Qualified Occupational Therapists. Copies of the new directory may be obtained from the Association, 175 Fifth Avenue, New York City.

RECENT ACCESSIONS TO THE LIBRARY

- Ahlswede, E. H., Practical treatment of skin diseases.
N. Y., Hoeber, 1932, 770 p.
- Andrews, C. L., How's your blood pressure?
N. Y., Macmillan, 1931, 225 p.
- Beyer, H. and Sciffert, A. Der Operationskurs des Hals-, Nasen- und Ohrenarztes.
Leipzig, Kabitzsch, 1932, v. 1.
- Bland, P. B. Gynecology, medical and surgical. 2. ed.
Phil., Davis, 1932, 1249 p.
- Bostock, J. The neural energy constant.
London, Allen, [1931], 181 p.
- Braun, L. Herz und Angst; eine ärztlich-psychologische Studie.
Wien, Denticke, 1932, 119 p.
- Bruhns, C. and Alexander, A. Grundriss der mykologischen Diagnostik.
Berlin, Springer, 1932, 206 p.
- Candwell, I. Damien of Molokai, 1840-1889.
N. Y., Macmillan, 1932, 203 p.
- Clark, A. J. Applied pharmacology. 4. ed.
London, Churchill, 1932, 590 p.
- Coates, V. M. and Delicati, L. Rheumatoid arthritis and its treatment.
London, Lewis, 1931, 114 p.
- Colin, H. Les diastases.
Paris, Doin, 1931, v. 1.
- Compton, P. The genius of Louis Pasteur.
N. Y., Macmillan, 1932, 361 p.
- Cushing, H. W. Intracranial tumours.
Springfield, Ill., Thomas, 1932, 150 p.
- Cutting, R. A. Principles of preoperative & postoperative treatment.
N. Y., Hoeber, 1932, 812 p.
- Danis, R. Technique de l'ostéosynthèse.
Paris, Masson, 1932, 160 p.
- Delmege, J. A. Towards national health; or, health and hygiene in England from Roman to Victorian times.
London, Heinemann, 1931, 234 p.
- Desaux, A. and Bontelier, A. Manuel pratique de dermatologie.
Paris, Masson, 1932, 2 v.
- Dible, J. H. Recent advances in bacteriology and the study of the infections. 2. ed.
London, Churchill, 1932, 476 p.
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St. Louis, Mosby, 1932, 360 p.
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Phil., Lea, 1932, 2 v.

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London, Routledge, 1932, 318 p.
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N. Y., Amer. Jour. of Cancer, 1931, 709 p.
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Phil., Lea, 1932, 272 p.
- Goodrich, A. W. *The social and ethical significance of nursing.*
N. Y., Macmillan, 1932, 401 p.
- Gould, A. G. and Dye, J. A. *Exercise and its physiology.*
N. Y., Barnes, 1932, 434 p.
- Graves, L. G. *Food in health and disease.*
N. Y., Macmillan, 1932, 390 p.
- Hays, H. M. *The modern conception of deafness.*
St. Louis, Laryngoscope, 1932, 149 p.
- Joll, C. A. *Diseases of the thyroid gland, with special reference to thyrotoxicosis.*
London, Heinemann, 1932, 682 p.
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Phil., Lippincott, [1931], 1012 p.
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München, Bergmann, 1932, 164 p.
- Kline, B. S. *Microscopic slide precipitation tests for the diagnosis and exclusion of syphilis.*
Balt., Williams, 1932, 99 p.
- Kowarski, A. *Klinische Mikroskopie.*
Berlin, Urban, 1932, 172 p.
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Paris, Masson, 1932, 886 p.
- Laubenheimer, K. *Lehrbuch der Mikrophotographie und Mikroprojektion.* 2. Aufl.
Berlin, Urban, 1931, 272 p.
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Leipzig, Thieme, 1932, 587 p.
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Chic., Univ. of Chic. Pr., [1932], 107 p.
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Chic., Univ. of Chic. Pr. [1932], 224 p.
- Liepmann, W. and Danelius, G. *Geburtshelfer und Röntgenbild.*
Berlin, Urban, 1932, 271 p.
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Torino, Unione Tipografico-Editrice Torinese, 1932, 416 p.

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London, Allen, [1932], 300 p.
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and possibilities.
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London, Bale, 1932, 203 p.
- Rahn, O. Physiology of bacteria.
Phil., Blakiston, [1932], 438 p.
- Rasmussen, A. T. The principal nervous pathways.
N. Y., Macmillan, 1932, 73 p.
- Richards, E. L. Behaviour aspects of child conduct.
N. Y., Macmillan, 1932, 299 p.
- Roessle, R. and Roulet, F. Mass und Zahl in der Pathologie.
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profilassi.
Milano, Soc. An. Istituto Editoriale Scientifico, 1931, 559 p.
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N. Y., Greenberg, [1932], 253 p.
- Sluss, J. W. and Martin, J. W. Emergency surgery. 5. ed.
Phil., Blakiston, [1931], 879 p.
- Smith, S. A. and Glaister, J., jr. Recent advances in forensic medicine.
London, Churchill, 1931, 194 p.
- Sneed, W. L. Orthopedics in childhood.
Phil., Lippincott, [1931], 318 p.
- Sollman, T. H. A manual of pharmacology. 4. ed.
Phil., Saunders, 1932, 1237 p.
- Stone, E. P. Medicine among the American Indians.
N. Y., Hoeber, 1932, 139 p.
- Storer, H. R. Medicina in nummis; a descriptive list of the coins, medals,
jetons, relating to medicine, surgery, and the allied sciences.
[Boston, Wright, 1931], 1146 p.
- Stout, A. P. Human cancer.
Phil., Lea, 1932, 1007 p.
- Strachstein, A. The penalty. Must we pay it?
N. Y., Blanchard, [1931], 136 p.

- Thorek, M. Surgical errors and safeguards.
Phil., Lippincott, [1932], 696 p.
- Vaughan, G. T. Papers on surgery and other subjects.
Wash., Roberts, 1932, 408 p.
- Weber, R. Pathologie und Therapie der entzündlichen Erkrankungen des Zahnmarks.
Stuttgart, Enke, 1932, 149 p.
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London, Nisbet, [1931], 232 p.
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N. Y., Century, [1932], 532 p.
- White House Conference on Child Health and Protection. Section I. Medical Service. Committee B. Prenatal and Maternal Care. Subcommittee on Obstetric Teaching and Education. Obstetric education. Report.
N. Y., Century, [1932], 302 p.
- White House Conference on Child Health and Protection. Section I. Medical Service. Committee C. Medical Care for Children. Subcommittee on Medical Education. Pediatrics: education and practice. Report.
N. Y., Century, [1931], 117 p.
- White House Conference on Child Health and Protection. Section I. Medical Service. Committee C. Medical Care for Children. Subcommittee on Nutrition. Nutrition service in the field. Report.
N. Y., Century, [1932], 139 p.
- White House Conference on Child Health and Protection. Section I. Medical Service. Committee C. Medical Care for Children. Subcommittee on Orthopedics and Body Mechanics. Body mechanics; education and practice. Report.
N. Y., Century, [1932], 166 p.
- White House Conference on Child Health and Protection. Section I. Medical Service. Committee C. Medical Care for Children. Subcommittee on Psychology and Psychiatry. Psychology and psychiatry in pediatrics; the problem. Report.
N. Y., Century, [1932], 146 p.
- White House Conference on Child Health and Protection. Section III. Education and Training. Committee C. The School Child. The school health program. Report.
N. Y., Century, [1932], 400 p.
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N. Y., Century, [1932], 592 p.
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Balt., Williams, 1931, 169 p.
- Williams, J. F. and Morrison, W. R. A text-book of physical education.
Phil., Saunders, 1931, 343 p.

Wustrow, P. Klinik der zahnärztlichen Orthopädie.

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Yellowces, H. Clinical lectures on psychological medicine.

London, Churchill, 1932, 310 p.

Zuckerman, S. The social life of monkeys and apes.

London, Paul, 1932, 357 p.



PROCEEDINGS OF ACADEMY MEETINGS

MAY, 1932

STATED MEETINGS

Thursday Evening, May 5, at 8:30 o'clock

I. EXECUTIVE SESSION

Reading of the Minutes.

Election of Fellows by Ballot.

Presentation of Diplomas.

II. THE SEVENTH HERMANN MICHAEL BIGGS MEMORIAL LECTURE:

Robert Koch and His Life Work, Lawrason Brown, Trudeau Sanitarium, Saranac Lake, N. Y.

Thursday Evening, May 19, at 8:30 o'clock

THE EIGHTH HARVEY LECTURE

"Histochemistry: Present State and Future," A. Policard, Lyons, France.
This lecture takes the place of the second Stated Meeting of the Academy for May.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, May 3, at 8:30 o'clock

I. EXECUTIVE SESSION

a. Reading of the Minutes.

b. Election of Officers:

For Chairman—A. Benson Cannon.

For Secretary—Louis Chargin.

For member of Advisory Committee—Howard Fox.

II. PRESENTATION OF CASES

a. Cases from the Beth Israel Hospital.

b. Cases from the Sea View Hospital.

c. Miscellaneous cases.

III. GENERAL DISCUSSION

Joint Meeting of the

SECTION OF NEUROLOGY AND PSYCHIATRY

and the

NEW YORK NEUROLOGICAL SOCIETY

Tuesday Evening, May 3, at 8:30 o'clock

I. EXECUTIVE SESSION

a. Reading of the Minutes.

b. Election of Officers of Section of Neurology and Psychiatry:

For Chairman—Byron Stookey.

For Secretary—Clarence Oberndorf.

For member of Advisory Committee—Joseph H. Globus.

II. PAPERS OF THE EVENING

- a. Pneumorachioclysis and cervico-lumbar irrigation in the treatment of meningococcic meningitis, Leon H. Cornwall.
- b. On tactile imagination and tactile after-effects, Walter Bromberg (by invitation), Paul F. Schilder.
- c. Surgical treatment of brain abscess, Francis C. Grant, University Hospital, Philadelphia (by invitation).
- d. Head injury—its neurologic and psychiatric aspect, Israel Strauss, Nathan Savitsky (by invitation).

III. DISCUSSION, Foster Kennedy, J. J. Moorhead, V. A. Zimmer (by invitation), Charles A. Elsberg, Paul F. Schilder, Joseph E. J. King, Raphael Lewy.

SECTION OF SURGERY

Friday Evening, May 6, at 8:30 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of Officers:
For Chairman—William Barclay Parsons, Jr.
For Secretary—William F. Cunningham.
For member of Advisory Committee—Robert H. Kennedy.

II. PRESENTATION OF INSTRUMENT AND CASES

- a. Clamp tourniquet, Harry Cohen.
- b. Sub-sternal thyroid adenoma with varicosities of the chest wall, Carnes Weeks.
- c. Mesenteric cysts with torsion of the mesentery, Philip J. Lipsett.
- d. Stab wound of the heart, Edwin G. Ramsdell.
- e. Three cases illustrating the first paper of the evening, Edward W. Peterson.
- f. Two cases illustrating the second paper of the evening, Joseph B. Stenbuck (by invitation).

III. PAPERS OF THE EVENING

- a. Mesenteric and omental cysts, Edward W. Peterson.
- b. Penetrating stab wounds of the chest. A study of 67 cases operated upon since June 1, 1931, John F. Connors, Joseph B. Stenbuck (by invitation).

IV. GENERAL DISCUSSION.

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Wednesday Evening, May 11, at 8:30 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of Officers:
For Chairman—C. N. B. Camac.
For Secretary—Howard Reid Craig.
For member of Advisory Committee—Louis F. Bishop.

II. PAPERS OF THE EVENING

- a. Scurvy: "The Plague of the Sea and the Spoyle of Mariners," Karl Vogel.
- b. The illustrated initial letters of the anatomic treatise of Vesalius (lantern slides), Samuel W. Lambert.

III. GENERAL DISCUSSION

SECTION OF PEDIATRICS

Thursday Evening, May 12, at 8:00 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of officers:
 For Chairman—John Caffey.
 For Secretary—Harry Bakwin.
 For member of Advisory Committee—Herbert B. Wilcox.

II. SINGLE CASE PRESENTATION WAS GIVEN BY THE FOLLOWING HOSPITALS:

Babies' Hospital, Chondrodystrophia dwarfism, hereditary ectodermal dysplasia, supernumerary fingers and esotropia, A. A. Weech (by invitation).

Bellevue Hospital, Late rickets, Richard Schoor (by invitation).

Fifth Avenue Hospital, Epileptiform seizures in patient with brain tumor and improved with ketogenic diet, John Metcalfe (by invitation).

Mt. Sinai Hospital, Leishmaniasis infantum, George J. Ginandes (by invitation).

Nursery and Child's Hospital, Case of myeloid leukemia with an initial leukopenic stage of seven months duration and erythrophagocytosis, Carl H. Smith (by invitation).

Post Graduate Hospital, Experimental treatment of inherited haemophilia, Marshall C. Pease.

Roosevelt Hospital, Osteitis fibrosa cystica with changes after partial parathyroidectomy, John F. Landon.

St. Luke's Hospital, Hemolytic jaundice, Harold W. Dargeon (by invitation).

St. Mary's Hospital, Meningococcus septicemia followed by meningococcus meningitis, Elizabeth Knox (by invitation).

St. Vincent's Hospital, Massive collapse of lungs following appendectomy, George B. Bader (by invitation).

Willard Parker Hospital, Pathological report, Lawrence W. Smith.

SECTION OF OPHTHALMOLOGY

Monday Evening, May 16, at 8:30 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of officers:
 For Chairman—Mark J. Schoenberg.
 For Secretary—Algernon B. Reese.
 For member of Advisory Committee—Herbert W. Wootton.

II. SCIENTIFIC MEETING IN COLLABORATION WITH THE STAFF OF THE
BROOKLYN EYE AND EAR INFIRMARY

- a. Grattage trachoma, P. Chalmers Jameson (by invitation).
- b. Progressive refraction changes following a trephine operation, James W. Smith.
- c. A new type of hand ophthalmoscope and accessories, John N. Evans.
- d. The effect of drugs on the cerebral circulation, Hubert S. Howe.
- e. Pathology and pathogenesis of sympathetic ophthalmia, J. Arnold DeVeer (by invitation).
- f. The first American journal and its editor, Ralph I. Lloyd.
- g. Essential hypertension. Observations on rabbits and man. Fundus studies, S. A. Agatston.

III. DEMONSTRATION BEFORE THE MEETING

- a. Slit lamp cases, M. L. Berliner, G. Bonaccolla (by invitation), I. Goldstein, W. L. Hughes, Benjamin Friedman (by invitation).
- b. Old ophthalmoscopes, William F. C. Steinbugler.
- c. Exhibition of a spot light object for perimetry, John N. Evans.

SECTION OF MEDICINE

Tuesday Evening, May 17, at 8:30 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of Officers:
For Chairman—Robert F. Loeb.
For Secretary—Henry J. Spencer.
For member of Advisory Committee—Mills Sturtevant.

II. PAPERS OF THE EVENING

- a. Incidence of rheumatic fever, John Staige Davis.
- b. Recent advances in knowledge of the function of the pituitary, Walter Timme.
- c. Recent advances in knowledge of the function of the ovary, Raphael Kurzrok.
- d. Discussion, Homer F. Swift, Irving H. Pardee, Earl T. Engle, Ph.D. (by invitation).

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, May 18, at 8:30 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of Officers:
For Chairman—George F. Hoch.
For Secretary—C. Travers Stepita.
For member of Advisory Committee—Thomas J. Kirwin.

II. PRESENTATION OF CASES

- a. A case of colon bacilluria with multiple calculi of the prostate

(operation with anatomical cure). Intestinal antiseptis with physiological cure, Victor C. Pedersen.

b. Traumatic anuria, Francis O. Harbach (by invitation).

Discussion, Anthony Bassler, Oswald S. Lowsley.

c. Inoperable cancers of the prostate, bladder and testes treated with irradiation, Archie L. Dean, Jr.

III. PAPERS OF THE EVENING

a. Cysts of the prostate, Benjamin S. Barringer.

b. Observations based on a series of 150 bladder cancers, George Gilbert Smith, Boston (by invitation).

IV. GENERAL DISCUSSION

SECTION OF OTOLARYNGOLOGY

Wednesday Evening, May 18, at 8:30 o'clock

I. EXECUTIVE SESSION

a. Reading of the Minutes.

b. Election of Officers:

For Chairman—Charles J. Imperatori.

For Secretary—David H. Jones.

For members of Advisory Committee—Thomas J. Harris, for 5 years, Francis White, for 4 years, to fill the unexpired term of David H. Jones (resigned).

II. PRESENTATION OF INSTRUMENT

Scissor hemostat, Arthur F. Warren (by invitation).

III. PRESENTATION OF PATIENTS

a. Radium in malignant tumors of the nasal sinuses, G. Allen Robinson.

b. Correction of post auricular defect by implantation of fascia lata, Charles M. Griffith (by invitation).

c. Laryngectomized patient—operation 14 years ago, John McCoy.

IV. PRESENTATION OF CASE REPORTS

a. Nasopharyngeal malignancy—report to 3 cases, E. H. Moyle (by invitation).

b. Otitic infections with gastroenteritis in infants, Max Rabbiner (by invitation).

(a and b were presented as a summary. Publication in full will be in the Transactions of the Section in the "Laryngoscope.")

V. PAPERS OF THE EVENING

a. The problems of the styloid process, Robert H. Fowler.

b. The use of Avertin in esophagoscopy, George R. Brighton.

c. My experiences with anesthesia for laryngectomy, William Branower (by invitation).

d. Tonsillectomy in the presence of thyroid disease, H. G. Bullwinkel.

e. Treatment of labyrinthitis, Daniel Cuning (by invitation).

f. The technic of some of the uses of surgical diathermy in rhinolaryngology, W. W. Morrison.

- g. Intranasal opening of the maxillary antrum by electro-surgery and coagulation, Louis Hubert.
- h. The value of dry treatment in acute infections of the middle ear and mastoid, Hugh Blackwell.

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, May 20, at 8:30 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of Officers:
For Chairman—Mather Cleveland.
For Secretary—Paul C. Colonna.
For member of Advisory Committee—Isadore Zadek.

II. PRESENTATION OF CASES

- a. Treatment of plantar warts by electrocoagulation. Clinical demonstration, K. G. Hansson.
- b. Posterior bone block for paralytic equinus deformity. Demonstration of cases, Francis Carr (by invitation).
- c. 1. Two cases of osteomyelitis of the cervical vertebrae
2. Compound fracture of an epiphysis of the finger with replacement. Seth Selig.

III. PAPER OF THE EVENING

Pathological changes and the clinical significance of intervertebral disc extension into the bodies of the vertebrae, David Sashin (by invitation).

IV. GENERAL DISCUSSION

SECTION OF ONSTETRICS AND GYNECÖLOGY

Tuesday Evening, May 24, at 8:30 o'clock

I. EXECUTIVE SESSION

- a. Reading of the Minutes.
- b. Election of Officers:
For Chairman—Francis W. Sovak.
For Secretary—Frederick C. Freed.
For member of Advisory Committee—Gerard L. Moench.

II. PAPERS OF THE EVENING

- a. The slowing of the foetal heart and its relation to foetal placental circulation, Morris Leff.
Discussion, William E. Caldwell, George B. Wallace, Samuel J. Scadron.
- b. Pregnancy and labor subsequent to abruptio placenta, Samuel S. Rosenfeld.
Discussion, Abraham J. Rongy.
- c. "Genital" anatomical averages obtained from superimposed tracings, Robert L. Dickinson.
- d. Roentgen pelvimetry—the Grid method and a modification, Herbert Thoms, New Haven.

Discussion, Leon T. Le Wald, Gerard L. Moench, Robert L. Dickin-
son.

AFFILIATED SOCIETIES

NEW YORK ROENTGEN SOCIETY

In affiliation with

The New York Academy of Medicine

Monday Evening, May 16, at 8:30 o'clock

I. 8:30 to 9:00 o'clock

Demonstration of interesting cases and roentgenograms.

II. 9:00 o'clock

- a. Observations on malignant metastatic invasion of the lungs through the lymphatics, Paul C. Swenson.
- b. A discussion of bone regeneration, Clay Ray Murray.
- c. Observations on the differentiation of malignant and non-malignant lesions of the large intestine, Ross Golden.

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

New York Meeting of the

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Under the auspices of

The New York Academy of Medicine

Wednesday, May 18, at 8:15 o'clock

- I. Bacterial Structure with Particular Reference to the Capsule, J. W. Churchman and N. V. Emelianoff (demonstrations will be available before the meeting).
- II. Precipitin Formation in *S. viridans* Subacute Endocarditis, D. Seegal, M. Heidelberger, and E. L. Jost.
- III. A Laboratory Method for the Diagnosis of Psittacosis in Man, T. M. Rivers and G. P. Berry.
- IV. Normal and Pathological Permeability of the Lymphatic Capillaries in Human Skin, S. S. Hudack and P. D. McMaster.
- V. Excretion of Lactic Acid in Sweat, E. H. Fishberg.
- VI. Biological Assay of Pregnandiol, R. T. Frank and H. Sobotka.
- VII. Protective Action of Copper and Iron Against *Bartonella muris* Anemia, J. Marmorston-Gottesman and D. Perla.
- VIII. Effect of Ca, K, and C_H on the Response of the Intestine to Drugs, W. Salant and W. M. Parkins.
- IX. Role of the NH_2 , OH and $-\text{As}=\text{As}-$ Groups in Parasitotoxic Action of Arspenamine Derivatives, L. Reiner and C. S. Leonard.

NEW YORK PATHOLOGICAL SOCIETY

In affiliation with

The New York Academy of Medicine

Thursday Evening, May 26, at 8:30 o'clock

I. DEMONSTRATION OF PATHOLOGICAL SPECIMENS

II. PAPERS OF THE EVENING

- a. The pathology of hemolytic jaundice, William P. Thompson (by invitation).
- b. Unusual metastases of malignant tumors; report of six cases, Angela M. Sala.
- c. Factors influencing types of bone resorption, Henry L. Jaffe (by invitation), A. Bodansky.
- d. A case of acute myeloid leukemia with unusual features, Edith E. Sproul (by invitation).

III. EXECUTIVE SESSION



DEATHS OF FELLOWS OF THE ACADEMY

ANNE TEFFT BINGHAM, 1 Madison Avenue, New York City; graduated in medicine from Syracuse University, Syracuse, N. Y., in 1900; elected a Fellow of the Academy January 15, 1920; died, May 20, 1932. Dr. Bingham was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the American Psychiatric Society and the Clinical Psychiatric Society. Dr. Bingham had been a member of the medical staff of the Metropolitan Life Insurance Company for nine years.

ARTHUR HUTCHINS CILLEY, M.D., 120 East 34 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1896; elected a Fellow of the Academy January 3, 1901; died, May 31, 1932. Dr. Cilley was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the American Orthopedic Society, a member of the Society of Alumni of the Post-Graduate Medical School and Hospital, also of the Hospital for Ruptured and Crippled. He was Chief Orthopedist to Cornell Clinic and Consulting Orthopedic Surgeon to Reconstruction Hospital Unit of the Post-Graduate Hospital and Riverside Hospital.

GEORGE FOSTER COMSTOCK, M.D., Saratoga Springs, N. Y.; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1883; elected a Fellow of the Academy March 4, 1897; died, June 1, 1932. Dr. Comstock was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, and Surgeon to The Saratoga Hospital.

WILLIAM WILLIAMS KEEN, M.D., Philadelphia, Pa.; graduated from Jefferson Medical College, Philadelphia, in 1862; elected an Honorary Fellow of the Academy February 4, 1904; died, June 7, 1932. Dr. Keen was the first American to be elected President of the International Congress of Surgery; he had been President of the American Surgical Association, the American Medical Association, the College of Physicians of Philadelphia; the Congress of American Physicians and Surgeons, and the American Philosophical Society. At the time of his death, Dr. Keen was 95 years old.

JOHN LESHURE, M.D., 924 West End Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1898; elected a Fellow of the Academy, March 6, 1902; died, June 10, 1932. Dr. Leshure was a Fellow of the American Medical Association, a member of the County and State Medical Societies, and Director of the Laryngological and Otological Department of the Lutheran Hospital.

WILLIAM BROADDUS PRITCHARD, M.D., Princess Anne, Maryland; graduated from the College of Physicians and Surgeons, Baltimore, in 1885; elected a Fellow of the Academy October 5, 1893; died, June 6, 1932. Dr. Pritchard was formerly Professor of nervous and mental diseases to New York Medical School and Hospital, he also had been Consulting Neurologist to City Hospital here, and the New York Neurological Hospital, and Consulting Neurologist to Knickerbocker Hospital, Staten Island Hospital and St. Vincent's Hospital, Staten Island.

IRA OTIS TRACY, M.D., 181 Hancock Street, Brooklyn, N. Y.; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1882; elected a Fellow of the Academy May 15, 1902; died, June 4, 1932. Dr. Tracy was a Fellow of the American Medical Association, and a member of the County and State Medical Societies.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VIII

JULY, 1932

No. 7

EDITORIAL

THE FIRST AUTHENTIC PERIODICAL OF MEDICAL HISTORY

In the 18th Century, there was a remarkable and significant extension of interest in the history of medicine, which had formerly cropped out only in spots and at long intervals of time. Such manifestations as Hippocrates on ancient medicine, Menon's *Iatrika*, the *Proaemium* of Celsus, the biographical sketches of Useibia and the subsequent contributions of Guy de Chauliac, Symphorien Champier, or Conring can scarcely be regarded as influential, and for a full quarter-century thereafter, little was done to improve upon the lengthy and credulous narrative of Leclerc. A wholly uncritical approach, portentous ignorance of or indifference to the basic sources of fact, an overweening assumption of omniscience and, in consequence, a facile tendency to improvisation are outstanding traits of Leclerc and of most of his immediate followers. Foreknowledge absolute of the status of medicine before and after the Flood is taken for granted and even the worries of Noah about the provisioning of the paired animals in his Ark and the disposal of their excreta is considered in one instance. The medicine of the Chaldeans, Egyptians and Assyro-Babylonians is derived respectively from Shem, Ham and Japhet. Noah and Moses are featured as founders of chemistry. The myths of classical antiquity are accepted as literally true, and chronology is dislocated to suit the whims of the improvisator. Dates for the most insignificant happenings are assigned with a facile assurance which would be ludicrous were it not palpably child-like. Burggrav in his *Libitina* (1701), Crause (1709), Al-

bert (1711), Rangius (1716) and others debate with unblushing confidence on "the fates of medicine" (*De fatis medicinae*). Some improvement in method but certainly no advancement in knowledge has been demonstrated in the work of Barkhausen (1716, 1723), who dealt with the history of medical theories and attempted to lead back to basic sources, of Goelicke (1713-23), who was critical to the point of being ill-natured, and of Schulze (1728), who advances sound views of things, but fixes the death of Adam at 9 a.m. in 3054 B.C., assigns 2329 as the date of the Flood and 1247 for the beginning of the Aesculapian Cult.¹ In all these matters, the *mens medica* of the period was uncritical and childlike. The so-called pragmatism of the later 18th Century historians, the tendency to regard practical results as the main criterion of advancement in medicine, began in England with Freind (1725-6), got its stride on the continent in Haller and culminated in the 5-volume treatise of Sprengel (1792-1803), which remained the most considerable and reliable record of our subject before the time of Haeser. Pragmatism came into being through the fact that the initial directives of 18th Century thought were no longer metaphysical but mathematical. Descartes, Spinoza, Leibnitz, and Pascal gave place to Newton, Petty, Halley, Fahrenheit, De Moivre, D'Alembert, Lagrange and La Place. Descartes (analytical geometry), Leibnitz (integral calculus) and Pascal (descriptive geometry, probabilities) were at once mathematicians and philosophers. Even in the transition period, the newer tendency had already been established by the publication of Newton's differential calculus (*Methodus fluxionum*, 1671), his *Principia* (1687), his treatise on Optics (1704), and by Locke's *Essay on the Human Understanding*, which derives knowledge from experience and established the primacy of common sense. The period of "enlightenment," which preceded the French Revolution,

¹See the careful analyses of these obsolete Latin text-books in Edith Heischkel's *Die Medizinhistoriographie im XVIII. Jahrhundert* (Leiden, 1931), for which we are grateful, as no one in his senses would ever dream of attempting to read or study them.

was characterized by an universal appeal to common sense, set off by a spontaneous and unswerving belief in the progressive perfectibility of the human species. This aim was to be forwarded by steady-going utilitarianism, a glorification of rationalism, rapid circulation of new discoveries and the novel device of an appeal to the public opinion thus enlightened. In other words, the appeal was virtually to an enlightened despotism, centering usually in the ruler and bulwarked by the cultivated classes. Fontenelle and others deliberately sought to popularize science among people of fashion, very much as Huxley and Tyndall attempted the same thing later with the working classes. All this tended to heighten the self-esteem of the recipients, and thus engendered the new view of history as a step-wise progression to the summit of human perfection already attained. Thus the subject came to be developed in a rigorous, systematic way, as in the mathematics or botany. Pope's "Order is Heaven's first law" points to the *Theos geometr* of the 18th Century deists. Even Apollo, in the words of Frederick the Great, had become "Newtonized."² Sprengel's criterion of pragmatism was "that it makes us wiser" (*wenn sie uns klug macht*). Its object was to teach. Its means to this end centered in the formal text-book. The metaphysical view of things persisted in Germany, where the mysticism latent in Kant, Goethe (*Faust*) and Beethoven determined in advance the intellectual tendencies of German romanticism. But even during the Romantic period (1801-30), the German medical historians (including Haeser) continued in the 18th Century tradition. Their ground-plan or frame-work was that of the 18th Century systematists; their aim that of pragmatism, to *teach* and disseminate sound views of the subject *urbi et orbe*; and in this they were wise.

In keeping with the program of disseminating knowledge among the intelligentsia of the time, the 18th Century witnessed the first great upthrust of medical societies

² Referring to poems of Voltaire and Haller about Newton and to Mme. du Châtelet's translation of the *Principia*.

and medical periodicals, both which originated in the 17th Century. In the 17th Century, the Royal Society (London) and the Académie des sciences (Paris) became more influential and informing than Oxford or Cambridge or even the Paris Medical Faculty. The Royal Prussian Academy of Sciences (Berlin) was founded in the year 1700. At Göttingen, Haller deliberately utilized the medical society, the medical periodical and the medical library (medical bibliography) as ways and means of getting the results he was after (the essential aim of pragmatism). His exploitation of bibliography, or "taking an account of stock" of past and present achievement (*sich Rechenschaft geben*), culminated in such great enterprises as the Index Catalogue, the Royal Society Catalogue of Scientific Papers, and the Berlin Catalogue of Incunabula. Haller got the material for his four bibliographies³ out of his own library, and, for the first time, indexed the articles in medical periodicals, utilizing, as copyists, his lady relatives and their friends, who did the work for pin-money. The medical periodicals of the 18th Century number well upwards of 100 items, and already cover such specialties as physiology, surgery, gynæcology, obstetrics, pediatrics, medical jurisprudence, public hygiene, military medicine, pharmacy, mesmerism and somnambulism, and even small-pox. Two, at least, are devoted to medical history, namely the *Archiv für Geschichte der Arzneykunde* (1790), known as Wittwer's *Archiv*, and Sprengel's *Beyträge zur Geschichte der Medicin* (Halle, 1794-6). A third, bearing the specious title *Giornale per servire alla storia ragionata della medicina di questo secolo* (Venice, 1783-95), is, in reality, a collection of abstracts of contemporary periodical literature, many of them unsigned, with an occasional original article on theoretic medicine (Castiglioni). The same thing is true of the Parisian *Recueils periodiques* (1754-7, 1796-1802, 1799), and other 18th Century repositories or year-books of abstracted medical literature of foreign and

³ Bibliotheca botanica, Zürich, 1771-2. Bibliotheca anatomica, 1774-77; Bibliotheca chirurgica, Berne, 1774-7. Bibliotheca medicinae practicae, Basel, 1776-8.

domestic provenance. Wittwer's *Archiv* has escaped the attention of Diepgen, Seemen, Edith Heischkel and other recent investigators of the status of medical history in the 18th Century, probably because it is a thin unpretentious octavo of 222 pages, in dingy pasteboard binding, the kind of item likely to be overlooked or shoved to the rear on library shelves, like an attenuated individual lost in a crowd. By reason of the prolonged ill health of its editor, it never got beyond the first number of volume I, which, however, was, in all probability, issued as a bound volume, complete in itself. Philipp Ludwig Wittwer, its editor, born at Nuremberg on May 19, 1752, was the son of Johann Conrad Wittwer (1725-75), an esteemed practitioner and obstetrician of Nuremberg, who published only a graduating dissertation on vomiting (1742). After some training under his father, the younger Wittwer studied medicine at the Universities of Altdorf and Strassburg, graduating from the latter institution in 1774, with a dissertation proposing an adaptation of current dispensaries or pharmacopœias to the actual needs of the time in which they were published. After a year of study in Paris, he settled down to practice in his native city, where he became a member of the local College of Physicians. During this Nuremberg period, Wittwer published a well known anthology of Strassburg medical dissertations in four volumes (1777-81). In 1873, he was called to the vacant chair of medicine at Altdorf, but, a year later, was forced to relinquish this position and return to Nuremberg on account of a nervous breakdown. The rest of Wittwer's short life was spent in prolonged travelling in search of health. He died at the age of forty on December 24, 1792. He was evidently highly esteemed in his native city, for an account of a memorial erected in his honor by the *Blumenorden* of Nuremberg, of which he was a member, was published a year after his death (1795). The catalogue of his fine library, published at Nuremberg in three volumes (1794), covers 1222 pages. The appearance of Wittwer's *Archiv* two years before his death, raises the question: did he perhaps lecture on history of medicine

during his incumbency of the Strassburg Chair? It seems possible, if not entirely probable, in the light of the investigation of Seemen,⁴ which goes to show that the subject was taught at all the German universities, during the latter half of the 18th Century, while there was an actual chair of the subject in the Paris Medical Faculty, held in succession by Goulin (1795-99) and Cabanis (1799-1808). Be that as it may, Wittwer's *Archiv* is a charming little item, which ought to attract the attention of collectors. Headed by a remarkably good mezzotint of Maximilian Stoll (1742-87), and an elaborate dedication to Moehsen (one of the earliest and ablest cataloguers of medical engravings and medals), it bears, on the reverse of the title page, the following motto of Cicero: *Nescire, quid antea, quam natus sis, acciderit, id est semper esse puerum* (To be ignorant of what happened before you were born is to remain an eternal boy). Wittwer's preface is along the broadest lines. He begins with a long series of questions: What is medical history, its scope, subdivisions, sources and aims? How much or how little has been done in this field to date and why? How can it be made more pragmatical, attractive and utilizable? What are the consequences of neglecting it? How can the fragmentary findings available be fused and approximated to the idea of an universal history of medicine? All this he answers by a lengthy citation from Hensler, who notices how little has been accomplished since Freind or the introductory bibliographies of Haller, and points out that the subject must be studied by major epochs and in connection with the history of philosophy. In keeping with the cult of pragmatism, Hensler defines history as the "Light of Truth and the Teacher of Life." Wittwer then resumes, stressing his long predilection for the subject, his desire to found such a periodical as far back as 1787 and the interruption of all his plans by repeated attacks of hypochondria. He proposes that his *Archiv* shall have the widest scope, covering 1. The

⁴Hans von Seemen: Zur Kenntnis der Medizinhistorie in der deutschen Romantik. [*Beitr. z. Gesch. d. Med.* hrsg. vom Inst. f. Gesch. d. Med., Leipzig.] Zürich, Leipzig, Berlin, 1926.

general history of medicine in all its ramifications, from primitive aspects up to epidemiology, in particular the effect of climate, form of government, religion, immigration, wars and conquests, degree and extent of culture upon the status of medicine in all times and places. 2. Biographies of great medical leaders and of notorious charlatans. 3. Bibliography, i.e., descriptions of rare or important medical books and MSS., additions to Haller, etc. 4. Extracts from travels of physicians or others, who have reported upon the status of medicine among primitive peoples; unprinted letters of deceased physicians of importance; accounts of paintings, etchings, monuments and other artistic productions relating to medicine; portraits of physicians; medical medals and coins; anecdotes, queries and themata. He requests that any such material available be sent to him in care of his publishers. Each volume of the *Archiv* will consist of two numbers, prefaced by a portrait of some famous physician. His analysis of the contents of the present No. 1 follows. These are:

1. A continued article by Ackermann on the history of the Empiric sect after Galen's time. 2. The text of a Latin MS. of the pseudo-Hippocratic ivory capsule fragment (*De capsula eburnea aphorismi*) edited by Stoll. 3. A German version of chapters VII-XI of Galen's *De sanitate tuenda*, dealing with the hygiene of infancy, by Johann Karl Osterhausen. 4. Prolegomena for a biography of Maximilian Stoll, including a bibliography of his writings, edited by Wittwer. 5. Four letters on travels in France, England, Holland and Italy during 1787-8 by J. C. G. Schaeffer, Court Councillor and Body Physician to the Prince of Thurn und Taxis.

In this assemblage of titles, covering ancient medicine, pediatrics, biography, bibliography and physicians' travels, we have already a fair representation of the kind of material which Wittwer had in his mind's eye. In content and quality of material, his thin volume will compare favorably with any of its successors, from Henschels' *Janus* (1846-53) to Sudhoff's *Archiv* (1907-32). With this slender sheaf of worthwhile contributions, the periodical literature of the history of medicine may be said to have made a more respectable start than most.

THE TREATMENT OF NEUROSYPHILIS*

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This discussion of neurosyphilis has for its goal object, a consideration of the prevention of the central nervous system manifestations of syphilis. It will be assumed that in syphilis, the central nervous system is usually invaded in the very early period of the disease, that in the majority of cases indications of this invasion are found through abnormalities of the cerebrospinal fluid, and that in many of the cases so involved, the usual routine treatment of syphilis is ineffective as far as central nervous system pathology is concerned. Evidence for these assumptions is to be found in many articles which have appeared in recent years. Our own experience has amply confirmed the hypothesis that routine treatment is not by any means entirely effective, whether this treatment is instituted in the very earliest stage of syphilis, or in the very late stage. Especially pertinent in this regard is the evidence presented by Moore of the cases of early syphilis showing the characteristically strong spinal fluid serology similar to what one finds in general paresis, which cases not only did not respond to vigorous anti-luetic treatment from the serological standpoint, but which developed definite late neurosyphilis.

Cases of neurosyphilis may be artificially divided into a number of groups on the basis of either clinical symptomatology, pathology, serological findings, or response to treatment. In a general way one will find that there is some correspondence between these different methods of classification, but there will be indeed many exceptions. The early cases, with very mild serological changes, usually fall into the group of meningeal disturbance, and many will respond quite well to various types of therapy. On the other hand, late cases, with strong serological abnormalities clinically represented by general paresis, having, from a pathological standpoint, an involvement of the true ner-

*Delivered before The New York Academy of Medicine, March 3, 1932.

vous elements, are much more difficult to treat satisfactorily. Between these two groups are many gradations and varieties.

From the standpoint of therapeutic results, one may well build up a hierarchy, from the simple meningeal cases to the most severe parenchymatous involvements, with gradations including the later meningo-vascular disorders and tabes dorsalis. It will be found, however, that there are many exceptions to the general rule of simply-evoked or more difficultly-obtained response to treatment.

In attempting to present the effectiveness of various therapeutic agents, one might begin therefore with the more simple cases and work up to the more severe. The other method of presentation, however, namely a consideration of the means that are most effective in the treatment of severe cases, and the application of the knowledge thus obtained to the more simple, is the plan of procedure of this presentation. The treatment of general paresis, then, will be the first consideration.

Let me emphasize at the beginning, that the type of treatment advocated for early systemic syphilis, that is, the routine treatment to be found in all text-book discussions on the subject, including courses of arsphenamin, bismuth, mercury, and iodid, have practically no value in the treatment of general paresis, nor does intraspinal therapy appreciably increase the effectiveness of the treatment.

In passing, it may be stated that very intensive arsphenamin treatment, combined with intraventricular, intracisternal, and intraspinal treatment, has some therapeutic value, but there are so many difficulties in the way of this type of treatment that it may be dismissed with only this mention.

The types of treatment that have been found most effective are, on the one hand, tryparsamide, and on the other hand, the febrile treatments. I shall not attempt to offer a careful analysis of the relative value of tryparsamide and fever treatment, nor shall I attempt to quote statistics to

show the exact percentage of satisfactory results obtainable. As a matter of fact, there are no satisfactory series of comparable cases treated by tryparsamide and fever respectively, hence any analysis that might be made would be extremely fallacious. I shall, therefore, have the temerity to make the rather dogmatic statement that the results of these two types of treatment are rather similar when considered from a percentage viewpoint. The literature is replete with statistics dealing with the results of malarial treatment, the series analyzed varying from a few cases to several thousands, and the final evaluation of successful results varying from approximately 25 per cent to 60 or 70 per cent, and indeed there are some statements that the treatment is hardly effective.

The inadequacy of all such statistics results from several causes, e. g., the criteria of improvement or arrest; the type of cases treated, that is, whether the material consists of rather early cases or whether it is made up of a majority of late, far-advanced cases; and finally, upon the amount of treatment given the patients.

Despite all these difficulties at arriving at any statistical conclusion, the average results of treatment are approximately as follows: 30 per cent of the cases treated make a good clinical-social recovery; another 30 or 40 per cent show definite evidences of some improvement as determined either by the clinical manifestations, serological results, or longevity.

As already stated, our own evidence indicates that the results with tryparsamide are quite similar to those obtained by febrile treatment. The most satisfying type of results is that in which the patient makes a clinical improvement so that there are left very little, if any, evidences in the psychological reactions of the patient of the inroads of the disease, and in which there is, at the same time, a complete serological recovery. An example of this type of result obtained in one case by the use of tryparsamide, and in another case by malaria, will indicate to what I refer.

CASE 1

D.O. 30 Diagnosis: General Paresis
Symptoms: Euphoria, grandiosity—2 weeks
Blood Wass. positive 5/11/23
Sp. Fl. Wass. positive (0.05cc) Cells 36, Glob. 3+
Total protein Gold. 5555554822

Tryparsamide 114 Mercury 22
Blood Wass. negative 4/6/26
Sp. Fl. Wass. negative (1.0cc) Cells 4
Total protein 34, Gold. 0000000000

CASE 2

C.B. 44 Diagnosis: General Paresis

Symptoms: 1 year before treatment

Blood Wass. positive 8/2/27

Sp. Fl. Wass. positive (0.05cc) Cells 106, Glob. 3+

Total protein 77, Gold. 3453210000

Malaria 5 paroxysms (jaundice)

Tryparsamide 144

Blood Wass. negative 3/11/30

Sp. Fl. Wass. negative (1.0cc) Cells 4, Glob. 0

Total protein 46, Gold. 0000000000

A little less satisfying, but perfectly satisfactory by the criterion of practical results, is the type of case in which there is a thoroughly good clinical-social recovery without serological improvement. The following cases exemplify this type of result.

CASE 3

D.R. 40
Diagnosis: General Paresis
Symptoms: Personality change, deterioration.
Blood Wass. positive 2/2/26
Sp. Fl. Wass. positive (0.2cc) Cells 12, Glob. 2+
Total protein 80, Gold, 5544311000
Tryparsamide 134
Blood Wass. negative
Sp. Fl. Wass. positive (0.4cc) Cells 16, Glob. 1+
Total protein 47, Gold, 4454200000
Clinically well

CASE 4

W.C. 59 Diagnosis: General Paresis
Symptoms: Eight months duration, speech defect,
 "dementia."
Blood Wass. positive 5/5/25
Sp. Fl. Wass. positive (0.1cc) Cells 8, Glob. 2.

Malaria 14 paroxysms

Tryparsamide 162

Arsphenamin 19

Bismuth 41

Blood Wass. positive 9/22/31

Sp. Fl. Wass. positive (0.4cc)

Cells 4, Glob. 1

Total protein 48, Gold. 5543200000

Clinically well.

It is my impression that this type of result is less satisfactory because of the greater probability of relapse. There may be some question about this statement, but it is a matter that needs further study.

Much less satisfying, from the human standpoint, but just as important from the point of view of theory and knowledge of the subject, is the type of case in which no satisfying result measured by the psychological status of the patient is obtained, but in which there is a serological cure and evidence of an arrest of the disease. We have many examples of this type of case in which the patient does not make a clinical improvement in regard to his social reactions, or to his mentality, but in which the physical condition remains excellent over a period of years, and in which there is a complete serological cure.

The maximum of clinical results, whatever they may be, are usually obtainable in the course of two, or three, or four months. On the other hand, the serological results always take a very much longer time. In fact, in many cases, a period of three, four, or five or more years are required for a serological cure. In some cases the serological recovery is relatively prompt, and a complete serological cure is obtained in the course of a year. These are in contrast to the majority of cases where, if serological cure results at all, it comes about only after several years. The reason for this difference is another of the problems of treatment that is very obscure, and which it is hoped that future studies will elucidate.

I have stated that it is my opinion that the effectiveness of tryparsamide and fever, from the statistical standpoint, is very similar. This does not mean, however, that in a given case one treatment is as effective as the other. I

have no doubt that in some cases fever therapy will bring better results than tryparsamide, and vice versa. It is, of course, impossible to have pure experiments to prove this contention. However, we have many illustrations of cases that have not done well with one type of therapy, and when the other is given, improvement ensues. The following case illustrates the effectiveness of malaria after a relative failure with tryparsamide.

CASE 5

K.B.	Diagnosis: Taboparesis	
Symptoms: Excitement.		
Blood Wass. positive 1/16/23		
Sp. Fl. Wass. positive (0.05cc)	Cells 28, Glob. 4+	
	Gold. 555555430	
Arsphenamin 42	Total protein	Mercury 28
	Tryparsamide 86	
Blood Wass. positive		
Sp. Fl. Wass. positive (0.1cc)	Cells 18, Glob. 2+	
	Total protein 38, Gold. 5553300000	
Malaria 14 paroxysms	Tryparsamide 100	
Blood Wass. negative 8/2/30		
Sp. Fl. Wass. negative (1.0cc)	Cells 0, Glob. 1+	
	Total protein 22, Gold. 2111000000	

There are cases in which either a variation or combination of treatment, or the repetition of treatment will produce success out of what appears to have been failure, as shown by the following case.

CASE 6

B.E 29	Diagnosis: General Paresis	
Symptoms: Depression		
Blood Wass. positive 9/30/24		
Sp. Fl. Wass. positive (0.1cc)	Cells 225, Glob. 2+	
	Total protein	Gold. 555531000
Tryparsamide 91		
Clinical relapse		
Blood Wass. positive 9/4/28		
Sp. Fl. Wass. positive (0.05cc)	Cells 70, Glob. 3+	
	Total protein 103, Gold. 5554310000	
Malaria 10 paroxysms	Tryparsamide 18	
Typhoid vaccine fevers 9	Bismuth 25	
Blood Wass. positive		
Sp. Fl. Wass. negative (1.0cc)	Cells 0, Glob. 1+	
	Total protein 40, Gold. 1110000000	
Clinically well.		

The foregoing indicates the complexity of the problem of the most adequate form of treatment for a given individual. Unfortunately, the limitations of time and space are such that this matter cannot be here discussed. I would merely pause to state that we are only at the beginning of our study of the best and most effective forms of treatment.

Let me now sum up in a didactic fashion my personal viewpoint of the treatment of general paresis. Results that are eminently satisfying are obtainable in 30 per cent or better of the cases of general paresis as we see them in the clinic and in private practice. The actual therapeutic attack may be made by tryparsamide or fever alone, but I believe unquestionably the most satisfactory results are obtained by a combination of these methods. It is perfectly feasible to start the patient with tryparsamide, which is the simplest satisfactory treatment available. If, after two or three months of treatment, the results are not what one wishes, then one may supplement the tryparsamide by fever, or if one begins at the outset by fever therapy, it is advantageous to continue the patient on tryparsamide until there is a complete serological cure. Fever may be produced therapeutically by malaria, typhoid vaccine, diathermy, or radio-thermy. One must again confess that there is no body of information that will allow one to draw hard and fast rules as to which is the most effective. Again, turning to personal experience, it is my belief that the typhoid vaccine is the least effective. I have had no personal experience with radio-thermy, nor is there enough experience as expressed in the literature, to allow one to draw any conclusion. My own experience with diathermy is not sufficient to allow of any dogmatic statement, but from what experience I have had, and from what literature there is, it seems a fair conclusion that it is equally as effective as malaria.

Next in order of difficulty of obtaining therapeutic results are the tabetic cases. A limited number of cases of *tabes dorsalis* respond very well to long-continued use of

arsphenamin, but in the majority this type of treatment is not reasonably successful. In this group of cases, intraspinal therapy unquestionably has a very high degree of effectiveness. There are, however, many objections to this method of treatment, among which may be mentioned the discomfort to the patient, the difficulty of the procedure limiting it to the use of a few specialists or clinics, the possibility of damage to the spinal cord, and the practical difficulty of getting the patient to submit to a sufficient number of treatments. Tryparsamide overcomes a great many of these objections and therefore, if as effective therapeutically, is far more satisfactory. The evidence at hand indicates that it is at least as effective therapeutically as the intraspinal treatment. Certainly, by the use of tryparsamide, aided at times by arsephenamin and bismuth, one is able to obtain a serological cure in almost every case of tabes. The time required, however, for this result varies tremendously. On the one end of the series one finds the cases that obtain a serological cure within a few months, and at the other end are the cases which take years, if the result is obtained at all. This difference in the result of treatment may be illustrated by two cases.

CASE 7

J.M. 52	Diagnosis: Tabes
Blood Wass. negative 6/19/23	
Sp. Fl. Wass. positive (0.05cc)	Cells 10, Glob. 3+
	Gold. 5555553200
Tryparsamide 85	
Blood Wass. negative	
Sp. Fl. Wass. negative (1.0cc)	Cells 3, Glob. 1
Total protein 28,	Gold. 0030000000

CASE 8

J.O. 53	Diagnosis: Tabes
Blood Wass. positive	
Sp. Fl. Wass. positive (0.1cc)	Cells 74, Glob. 2+
	Total protein 59, Gold. 3442100000
Tryparsamide 180	Arsphenamin S Intraspinal 1
Blood Wass. doubtful	
Sp. Fl. Wass. negative (1.0cc)	Cells 2, Glob. 1+
Total protein 34,	Gold. 5532100000

The clinical results vary almost as much as the serological results. There are certain cases in which a very few injections of tryparsamide will free of lightning pains, crises, and the like, and improve the general condition and allow for considerable improvement in the ataxia in a very short period. In other cases, the improvement will ensue only after many months of treatment. Whereas, on the other hand, there are cases which seem to do badly both in general physical health and as regards the rapidity of progress of the ataxia and increase in pains.

Even more disturbing to our intellectual attitude about the treatment are the cases which show relatively prompt serological cures, but in which the symptoms are unabated. Thus, there are cases in which, despite serological cure, gastric crises continue with their previous regularity, and severity. We see cases which in spite of the serological cure, go on to the development of the destructive joint changes characteristic of the so-called "Charcot joints."

Once more we must take refuge from a discussion of the reasons for these failures, in the limitation of time and space.

The next question is whether fever is more or less effective in handling the tabetic problem. The literature indicates that malarial therapy is not as effective in *tabes dorsalis* as in general paresis. Our own experience, which I fear is not wide enough to allow one to attempt to overthrow the more extended reports found in the literature, nevertheless inclines me to the belief that fever is extremely effective in many cases of *tabes*, especially from the clinical viewpoint. This may be illustrated by the following case.

CASE 9

J.M.

Diagnosis: *Tabes*, Gastric crises

Blood Wass. negative 6/29/25

Sp. Fl. Wass. positive

Cells 66, Glob. 2+

Gold. 4443200000

Tryparsamide 60

Intraspinal 2

No relief of symptoms

Blood Wass. negative

Sp. Fl. Wass. negative (1.0cc) Cells 2, Glob. 1+
Total protein 27, Gold. 22000000000

Malaria 18 paroxysms

Blood Wass. negative

Sp. Fl. Wass. negative (1.0cc) Cells 0, Glob. 1+

Total protein 33, Gold. 0000000000

Patient symptom-free.

I may sum up my experience in the treatment of tabes as follows. At the present time tryparsamide would seem to be the best method of treating the majority of cases. Where this is not sufficiently effective, or where there are contraindications, intraspinal therapy has a high potency, and one has a considerable degree of hope in the effectiveness of fever for those cases which have not responded satisfactorily to tryparsamide. A great majority of cases, therefore, may be expected to show both clinical improvement and serological cure. At least, an arrest of the progress may be usually expected although there is an occasional exception to this rule.

The treatment of the meningeal type of neurosyphilis is, on the whole, simple and satisfying. In both the early and late varieties of this disorder, tryparsamide may be expected to give a serological cure in almost every case. In this variety of disorder, tryparsamide acts almost, if not entirely, as a specific drug. In the majority of instances, clinical improvement is very prompt and serological cure usually occurs within the first year. There are cases, however, in which prolonged treatment may be required to get the serological effect. Once more we present two cases to illustrate the variation in time factor in obtaining serological results.

CASE 10

E.E. 30 **Diagnosis:** Meningovascular neurosyphilis,
(extra-ocular palsy)

Blood Wass. positive 10/16/26

Sp. Fl. Wass. positive Cells 440, Glob 3+

Total protein 85, Gold. 5553210000

Tryparsamide 43

Blood Wass. negative 10/26/27

Sp. Fl. Wass. negative (1.0cc) Cells 0. Glob. 1+

Total protein 43, Gold. 2211000000

CASE 11

R.F. Diagnosis: Meningovascular neurosyphilis.

Blood Wass. negative 4/3/25

Sp. Fl. Wass. positive Cells 44, Glob. 2+

Total protein 333, Gold. 0001144321

Tryparsamide 90

Blood Wass. negative 5/3/30

Sp. Fl. Wass. positive (1.0cc) Cells 4, Glob. 1+

Total protein 70, Gold. 1110000000

Fever treatment is rarely, if ever, required in this variety of neurosyphilis. In fact, in our experience, it has not been necessary to resort to this form of treatment, and therefore I have no personal experience with its effectiveness. That it is effective, however, would be expected from logical reasoning based on the experience with other types of neurosyphilis, and this is verified by the experience as reported in the literature on the subject.

No consideration will be given to the pure vascular types of neurosyphilis because this will widen the field too greatly, and presents an entirely different subject, the subject of vascular syphilis in which the central nervous system damage is merely incidental to a disease of the blood vessels.

There are several other variations of clinical and pathological effects of syphilis on the nervous system, the treatment of which we must also avoid at this time.

The logical conclusion which would seem to flow out of what has been said up to this point is that with tryparsamide and fever therapy at our disposal, the majority of cases of syphilis of the central nervous system can be effectively handled, if not from the standpoint of rehabilitation yet from the theoretical standpoint of a slowing up of the process and a serological improvement or cure. The great handicap, from the standpoint of satisfactory clinical results, is that the patients, when obtained for treatment, are so far advanced in the disease in many instances, with so much damage to the nervous system, that the most that can be expected is a partial restitution of the individual as a functioning organism.

Fortunately the diagnosis of neurosyphilis is practically quite simple through the examination of the cerebrospinal fluid. As has already been said, the majority of cases that develop the severe nervous system lesions show abnormalities in the cerebrospinal fluid from the very early stages of syphilis. It is therefore only necessary to follow adequately the cerebrospinal fluid in the course of syphilis in order to have an index in the first place as to the potential probabilities of nervous system damage, and secondly, as to the effectiveness of the type of treatment used. I have already stated that in many cases, arsphenamin, bismuth, and mercury do not effectively hinder the progress of syphilis in the nervous system. Perhaps two cases, one of early, and one of late syphilis, developing neurosyphilis while under arsphenamin therapy, may be used as evidence for this statement.

CASE 12

D.G. Diagnosis: Primary Syphilis Meningeal neurosyphilis
Primary sore March, 1930. Blood Wass. positive

Neo-arsphenamin 15 Bismuth 9

Blood Wass. negative 9/30/30

Sp. Fl. Wass. negative Cells 0, Glob. 0

Total protein 48, Gold. 0000000000

Severe headaches

Bismuth 7 Neo-arsphenamin 2 Silver arsphenamin 8

Blood Wass. positive 5/7/31

Sp. Fl. Wass. negative Cells 204, Glob. 1+

Total protein 150, Gold. 4555555554

Clinical cure with tryparsamide

CASE 13

W.M. 36

Diagnosis: Latent Syphilis

Symptom-free

Blood Wass. positive 10/24/27

Sp. Fl. Wass. negative (1.0cc) Cells 0, Glob. ?

Gold. 0000000000

Neo-arsphenamin 39

Bismuth 13

Blood Wass. positive 9/14/29

Sp. Fl. Wass. positive Cells 56, Glob. 3+

Total protein 100, Gold. 5555555300

Speech defect, unequal pupils, mental confusion

Tryparsamide 98

Bismuth 71

Blood Wass. negative 10/24/31

Sp. Fl. Wass. negative (1.0cc) Cells 45, Glob. 1+

Clinically well Total protein 27, Gold. 5555310000

In both these cases tryparsamide produced a successful clinical result.

By this devious route, we have finally reached the point which I set out to make at the beginning of this paper, namely, that prevention of the devastating effects of syphilis upon the nervous system is theoretically possible, and that practically it can be obtained with the methods now available in nearly every case. Having shown the effectiveness of our therapeutic agents in halting the progress, in various types of neurosyphilis even after the in-roads have been great and the foothold of the spirochetes firmly established, we are in a position to maintain the thesis that if similar treatment were instituted much earlier, arrest of the progress could be much earlier obtained, and the damage minimized, if not entirely avoided.

In my concluding remarks, I would like to emphasize that syphilis is a serious disease because of its effects upon two great systems, the cardiovascular system, and the nervous system. The other effects of syphilis are much less important, much less serious, and much more amenable to simple antiluetic therapy. From our standpoint, therefore, it is of the utmost importance that every case of syphilis should be considered as to its actual or potential involvement of the nervous system. This means a careful neurological survey of the infected patient from the very earliest to the latest period of the disease, and this clinical consideration must be checked by examination of the cerebrospinal fluid. When the cerebrospinal fluid is found to show changes characteristic of central nervous system invasion, the effect of treatment on the spinal fluid serology must be given first place in the future treatment. If this is done in the early stages of syphilis and it is found that the type of treatment given does not produce serological improvement, it then becomes necessary to change to the treatment that will be found effective. This means, specifically, that where arsphenamin, bismuth, and mercury, are found to be ineffective in producing serological cure,

one must turn either to tryparsamide, or fever therapy, or a combination of the two, and if this principle of treatment is adhered to, there is, in my opinion, ample evidence to make one believe that the central nervous system involvement may be eradicated or at least held in check.



CARDIOVASCULAR SYPHILIS*

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Our knowledge of the behavior of syphilis in the cardiovascular system has passed through interesting stages in its development. The first stage was that of discovery. To Morgagni, in 1761, goes the credit of clearly recognizing the relation between syphilis and aortic aneurysm. The next definite step was taken by Ricord in 1845, when he gave us the earliest description of syphilis of the heart. He described a gumma of the myocardium. Then our own Dr. Welch, in 1876, added to the picture that of syphilitic aortitis; and Döhle, in 1885, first made clear and insisted upon the relation between syphilis and lesions of the aorta. The final step in the stage of discovery was taken by Reuter, in 1906, when he demonstrated the *treponema pallidum* in the wall of the aorta in syphilitic aortitis.

The next stage in our knowledge is that in which the facts that had been obtained from postmortem material were applied to the diagnosis of syphilis of the heart in the living. This only began in 1906, after the discovery of the Wassermann reaction. Longcope¹, in 1913, painted a very clear picture of the diagnosis and treatment of syphilitic aortitis, and Brooks², in the same year, laid strong emphasis upon involvement of the myocardium, both in the secondary and tertiary stages of the disease. Warthin³, in 1917, attracted further attention to the myocardial lesions of syphilis.

Now it is possible that we are entering upon a third stage in our knowledge of syphilis of the cardiovascular system. Syphilis has been fairly adequately treated for the past fifteen years. Much of the fundamental work has been done in the pathology and the clinical diagnosis of the condition. Nevertheless, we know very little about

*Delivered before The New York Academy of Medicine, March 3, 1932.

such important points as the time when aortitis begins to be manifest, the efficacy of early treatment in preventing cardiovascular involvement and the influence of treatment upon the course of the disease. With our recent development of the statistical method of study of large numbers of patients, over long periods of time, and with our highly developed system of follow-up, is it not possible that we are on the way toward providing an answer to many of these important questions in the natural history of the disease?

It is obviously not possible nor desirable to give, within the limits of this paper, a formal presentation of the entire subject of cardiovascular syphilis. Instead, an attempt will be made to paint a picture of the disease as a whole based upon the fundamental work that has been done in the past and, at the same time, to call attention again to the great gaps in our knowledge that make this picture incomplete. In the past, our thinking has been hampered by the habit of considering the various manifestations of syphilis of the cardiovascular system as separate disease entities. We have been drilled in the symptoms and signs of aneurysm, of aortitis, or of aortic insufficiency, and some of us have lost sight of the fact that they are only different manifestations of the development of the same pathologic process.

To begin at the beginning, in what manner does the spirochete reach the cardiovascular system? From the chancre, the organisms invade the blood stream and the lymphatics, pass through the right heart and into the lungs. Here those that do not pass through into the pulmonary veins and thence back into the heart and the general circulation are carried by the pulmonary lymphatics into the tracheo-bronchial lymph nodes. From here they are thought to pass by retrograde lymphatic flow into the tissues of the mediastinum and into the perivascular lymph spaces about the vasa vasorum in the adventitia of the aorta. Martland⁴ has offered an ingenious explanation of the relative rarity of congenital syphilis of the heart and aorta. He has pointed out that in utero the pulmonary

circulation is small and that, therefore, only a small number of spirochetes are carried to the lung and thence to the tracheo-bronchial lymph nodes and aorta.

Now let us look for a moment at this matter of congenital syphilis. McCulloch⁵ suggests that infants that are still born or die before aged two, correspond to the group of adults with generalized syphilitic invasion, the secondary stage. At postmortem, the myocardium shows evidence of syphilitic involvement with fibrosis and round cell infiltration. Spirochetes are often demonstrated, more frequently in the myocardium, but also in the aorta. The children that survive this period of invasion have either temporarily or permanently overcome their infection. Some of them, in later life, will develop syphilitic aortitis or myocardial gummata. Lamb⁶ states that aortitis has been reported at ages twelve, seventeen and nineteen. On the other hand, careful clinical studies by Matusoff and White⁷, McCulloch⁵, Givan⁸, Previtali⁹, and others, have uniformly failed to show any demonstrable clinical signs of syphilitic heart disease in congenital syphilitics that survive. Is it not possible that in congenital syphilis, as in acquired syphilis, there is a long latent period from the time of infection to the onset of clinical signs and symptoms? To answer this very important question, we need more studies on older congenital syphilitics, and we need to keep them under observation, if possible, until death. To my knowledge, no such study has been made. Thus, to recapitulate, is it not possible that congenital syphilitics that are still born or that die during early infancy are in the period of invasion of the spirochetes which have come by way of the blood stream and invade the myocardium? If the individual survives, these organisms have been removed by phagocytosis, making myocardial lesions uncommon in those that outlive this period. The spirochetes that have been caught in the mediastinal lymph nodes, however, may reach the perivascular lymph spaces of the vasa vasorum in the aorta and initiate the lesions of aortitis. This condition we should expect to discover from fifteen to twenty years later.

Now let us turn our attention to some of the problems of the cardiovascular system in acquired syphilis. In this discussion, no attempt will be made to catalogue all the symptoms and physical signs of aortitis, aortic insufficiency and aneurysm, because they are too well known and have been ably recounted by others. Instead, let us think of syphilis of the cardiovascular system as a whole, and let us discuss some of its special problems. In the first place, why is it that the diagnosis is rarely made until twenty years after the primary lesion was acquired? Of course, one obvious explanation presents itself; the patient usually does not come for examination of the cardiovascular system until he is aware that something is amiss. Unfortunately, he does not reach this state until twenty years have elapsed since the chancre. It is generally agreed that infection of the heart and aorta takes place during the secondary stage of syphilis. The spirochetes probably lie inactive between the muscle bundles or in the perivascular lymph spaces and the vast majority are removed by phagocytosis. The remainder lie dormant for years, causing little or no tissue reaction. Fordyce¹⁰ has suggested that allergy may offer an explanation for this phenomenon. The tissues may slowly become sensitized to the spirochetes so that, whereas in the beginning they did not react to the presence of these organisms, in the end, after several years, they react with edema, round cell infiltration and destruction of tissue, resulting in the development of recognizable clinical symptoms.

Some of the early writers have told us that a diagnosis of involvement of the heart can be made during the secondary stage of the disease. They point to palpitation, shortness of breath, tachycardia, bradycardia, premature beats and the development of apical systolic murmurs as evidence that this has occurred. They feel that the diagnosis is strengthened when these symptoms and signs clear up promptly under antiluetic treatment. More recently, workers who have studied cases of primary and secondary syphilis have failed to find definite evidence of involvement of the heart or aorta. The electrocardiogram and the x-ray

have shown no changes¹¹, and the symptoms and physical signs have been considered too indefinite to make a positive diagnosis. Clearly, the two views are diametrically opposed, and in order to arrive at a final conclusion, it will be necessary to study a large series of young syphilitics in the primary and secondary stages with all the means of cardiovascular examination at our disposal, and to employ very rigid criteria.

In the present state of our knowledge, what are the earliest recognizable symptoms of syphilitic heart disease? It will be remembered that the earliest lesions are in the arch of the aorta, above the semilunar valves. Aortic insufficiency, aneurysm and syphilitic coronary disease are late lesions. Therefore, we must try to diagnose syphilitic aortitis before these sequelæ have appeared. Lamb⁶ found in his series of 26 cases of uncomplicated aortitis that eleven, or nearly half, had no symptoms whatsoever. Those that did have symptoms complained first either of substernal pain or paroxysmal dyspnea. The substernal pain was present most of the time but aggravated by exertion or emotion. He states that autopsy has shown that this symptom is not necessarily connected with changes in the coronary arteries.

White¹² states that aortitis itself may be symptomless, but that sometimes there is a more or less constant dull ache high up under the sternum. With our greater familiarity with the pain of coronary disease today, is it not possible that critical studies may be able to separate the early cases of aortitis from the more advanced, in which the mouths of the coronary arteries have become involved in the syphilitic process? Carter¹³ calls attention to another early symptom; the abrupt onset of dyspnea on exertion, with slight edema. Thus, to help us in the early diagnosis of syphilitic aortitis, we have substernal distress or aching, paroxysmal dyspnea, often nocturnal, and the abrupt onset of shortness of breath on exertion. In addition, if we find a systolic murmur at the aortic area, a hollow ringing aortic second sound, in the absence of hypertension, evi-

dence in the teleoroentgenogram of a widened aorta, and a history of syphilis or a positive Wassermann reaction, the diagnosis of syphilis of the aorta has been made.

Now let us turn to the problem of syphilis of the myocardium. Gummata of the myocardium have been described since our earliest knowledge of syphilis of the heart. Their incidence is not very high but they are occasionally the cause of sudden and unexpected death. They are primarily vascular in origin, in that they begin as areas of round cell infiltration and necrosis about one of the branches of a coronary artery. True syphilitic myocarditis with diffuse infiltration of plasma cells between the muscle bundles, and parenchymatous degeneration of the muscle fibres, is a much rarer lesion, however. Warthin¹⁴, in the course of his writings, has laid more and more stress upon chronic and acute syphilitic myocarditis. He states that the important, if not predominating, rôle played by syphilis in myocardial incompetency is not being recognized. His work, however, has not been confirmed by other careful students. It has, however, resulted in a tendency to overemphasize the myocardial lesions and thus distract attention from the aorta. Carter and Baker¹³ found the myocardium alone involved in relatively few cases after gummata have been excluded. White¹² states that cardiovascular syphilis consists, therefore, primarily of luetic aortitis, infrequently it means myocardial disease. To recapitulate then, there is definite proof that myocardial gummata occur occasionally, but the existence of a true diffuse syphilitic myocarditis in acquired syphilis needs further postmortem proof.

Now what are the criteria for the diagnosis of syphilis of the myocardium? Given an unusual enlargement of the heart without demonstrable cause, a diffuse apex thrust without murmurs and with a poor first sound at the apex and a low systolic blood pressure in a patient with a positive Wassermann reaction and Carter¹³ states that syphilitic involvement of the myocardium should be suspected. We

have seen one patient that fulfilled all these criteria and autopsy showed a large gumma in the myocardium.

Now before we discuss the treatment of cardiovascular syphilis, it is well for us to have in mind a clear picture of the morbid processes we are attempting to influence. In the first place, we know that the average duration of the disease from the chancre to the first diagnosis of cardiovascular syphilis is twenty years¹⁵. Again we know that the average period from the chancre to death is twenty-three years¹⁵. We remember the extensive changes that have taken place in the wall of the aorta, in an aneurysm, or in the aortic valves, in aortic insufficiency before a clinical diagnosis is usually made. Because of these facts, we approach the problem of treatment in true humility of spirit. When we begin treatment, the disease is already far advanced, and in spite of our best efforts, death comes on apace and the postmortem often shows a surprising amount of aortitis, in spite of so-called thorough treatment.

Gager¹⁶ has recently called attention to some observations upon the comparative incidence of cardiovascular lesions in syphilis before and since the salvarsan era. Langer found syphilis in 4.02 per cent of necropsies in Virchow's Krankenhaus in 1906-07, and 4.32 per cent in 1925. However, the incidence of aortitis was 33.3 per cent in the first group before the salvarsan era and 83.87 per cent in 1925. Heller found that the number of aneurysms had quadrupled since salvarsan. Schlesinger showed that the time interval from the chancre to death was 23.4 years in untreated cases, 22.1 years in partially treated, and 15 years in the well treated. Whether these figures will be borne out by similar studies in this country remains to be seen. Nevertheless, they make us pause before we advocate vigorous antisyphilitic treatment for cardiovascular lues. The plans advocated by White¹², Carter¹³, Lamb⁶ and many others are similar in that they are all conservative and limit the use of neosalvarsan to small doses. It is agreed that antilnetic treatment should be omitted during periods of congestive failure and that when given, it should be in carefully plan-

ned courses with definite rest periods. The following plan is offered as one that has proven reasonably satisfactory in our hands. Treatment is begun with a course of mercury salicylate 0.03-0.06 gm. intramuscularly, once a week, for six weeks. At the same time, potassium iodide up to gms. 2, three times a day is given. Then a rest period of two months is allowed followed by a course of potassium bismuth tartrate 0.1-0.2 gm. intramuscularly until 2 gms. have been given, provided no toxic symptoms appear. After another rest period of two months, a course of six injections of neosalvarsan may be given, beginning with 0.1 gm. and increasing up to 0.45 gm. at weekly intervals. This plan of treatment will occupy about one year and should be continued for a second year and modified to suit the needs of the individual case. It is not often that one obtains a permanently negative Wassermann in these patients and, therefore, not the Wassermann reaction but the clinical condition of the patient should be the guide for treatment. The greatest danger is in overtreating these patients. If after a reasonable course of treatment they are doing well, they had best be left alone and kept under observation. It has been conclusively shown that the average duration of life from diagnosis of cardiovascular syphilis to death is from two to three years. A much larger series of carefully treated cases than have been reported so far is needed to show that this life expectancy can be increased. The hope for the future in the prevention of cardiovascular syphilis depends upon measures to prevent syphilis itself. Whether thorough treatment of the primary stages will prevent later involvement of the heart and aorta, it remains for further studies to show.

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THE PATHOLOGY OF SYPHILIS*

WITH SPECIAL REFERENCE TO THE DEVELOPMENT OF LUETIC AORTITIS

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The pathology of syphilis of the circulatory and nervous systems will be discussed from the viewpoint of a general pathologist, outlining the anatomical pathways of infection in acquired syphilis.

Most of the facts herein stated are generally accepted by recent authorities and are based upon clinical, pathological and experimental evidence.**

I shall draw from these some deductions and conclusions which may point the way to further research into, and increased understanding of this disease.

INOCULATION AND PRIMARY INCUBATION PERIOD

The *treponema pallidum* is usually deposited on an abrasion on the genitals. An abrasion is, however, not necessary and it may often be microscopic.

The spirochetes on account of their motility and also probably due to the capillary attraction of the open lymph-spaces are carried deep into the initial site of inoculation and there is a rapid reproduction of the organisms in the lymph-spaces and perivascular lymphatics.

Many pass rapidly into the capillaries and reach the important viscera within two to three days after inoculation. Hence, so-called abortive excisions of the chancre and abortive injections of arsphenamines, etc., will not prevent the development of syphilis.

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**In preparing this sketch, I have quoted extensively from the writings of Stokes, with whose views I am in entire accord.

Syphilis is, therefore, a systemic general infection days and even weeks before the appearance of the chancre.¹

The greater number of the rapidly reproducing spirochetes, however, enter the surrounding lymphatics and drainage on the slower lymphatic stream to the regional lymph-nodes begins.

PRIMARY STAGE—CHANCRE

As the rapidly growing spirochetes increase in number, the endothelial cells of the capillaries swell and an obliterating endarteritis occurs. Many new capillaries are formed. Perivascular collections of lymphocytes and plasma cells appear at an enormous rate and a papule with induration results. The typical Hunterian chancre, a local defense reaction at the site of inoculation, is formed.

Spirochetes rapidly reproduce and the initial sore teems with organisms. The direct feeding of the blood stream continues and increases, producing a bacteremia. Multiple, metastatic foci develop throughout the body. Their number, location and activity are proportional to the virulence of the organisms and the host.

The feeding of the slow lymphatic stream increases. Spirochetes reach the regional lymph-glands. Many are killed by the phagocytic activity of the reticuloendothelium of these nodes but some always survive and pass these defensive reservoirs and eventually reach the blood through the lymphatic duct, etc., or remain locked up in the lymph-nodes, to reinfect the lymph-stream or blood years after.

Clinically, during this stage, the chancre develops with wide variations in size and appearance. The local lymphadenitis develops with satellite bubo. Systemic symptoms, such as headache, pains in bones, etc., are frequent and even occur before the chancre. The blood begins to show a positive Wassermann reaction.

EARLY SECONDARY STAGE

The chancre now heals with the production usually of a tell-tale scar. Spirochetes become fragmented and scant.

complete and provides bases for relapses, which are so characteristic of all stages of syphilis.

Spirochetes disappear from the blood, or occur in occasional showers.

In no stage of syphilis do the spirochetes multiply in the circulating blood to any appreciable extent.

Parenchymatous tissues, such as the lungs, heart muscle and liver, rid themselves of spirochetes by drainage into the regional lymphatics and lymph-nodes.

The spirochetes enter the perivascular lymphatics, the lymph-node reservoirs and inaccessible parts of the bones and nervous system, where they cannot be reached by the circulation. Here they rest, or reproduce in the quiet, mild, anaerobic lymph. *Syphilis now becomes a disease of the lymphatics and ceases to be a blood disease*, except for occasional showers of spirochetes, usually scant in number, which may be thrown into the blood stream due to the re-awakening of old microscopic foci.

Clinically, in this stage, the secondaries disappear spontaneously. Systemic manifestations subside. The only clinical evidence remaining being a palpable spleen and liver and asymptomatic neurosyphilis.

Due to defects in resistance or revival of the partly extinguished foci, any lesion in primary or secondary stage may reappear, especially those on the mucous membranes.

INFECTION AND DRAINAGE OF CERTAIN VISCERA

The mode of infection by the blood stream and the manner of the riddance of spirochetes from some of the viscera in the early and late secondary stage is of great importance, and must be considered in more detail.

THE LUNGS

In the stage of bacteremia when the chancre is feeding the blood stream with innumerable spirochetes, the lungs are the first important organs to receive the dosage of or-

ganisms. In fact, on account of their very great capillary area, they receive a greater dosage than perhaps any other part of the body, with the exception of the skin.

The lungs are the most important and extensive capillary filtering bed of the venous circulation for large sized particles.

Let us take for example, a case of septic endometritis, complicated by a thrombophlebitis of an ovarian vein. Constant showers of hemolytic streptococci, mixed with blood platelets, fibrin, polymorphonuclears and agglutinated cocci enter the inferior vena cava, pass rapidly through the right side of the heart and enter the lungs. Most of the streptococci are filtered out or retained in the lungs and multiple, symmetrical, bilateral, hematogenous, embolic abscesses occur. Infection of the pleura by continuity, or by rupture of a surface abscess, with the production of an empyema often ensues. The lungs in such cases show a remarkable ability to rid the blood stream of the infection. Sometimes the patient may even recover. If she dies, there may be little evidence of systemic emboli.

In the bacteremia in the second stage of syphilis, however, the spirochetes are unaccompanied by large size particles, such as agglutinated bacteria, etc., and it is reasonable to suppose that most of the spirochetes easily pass through the lung capillaries and enter the systemic circulation.

Many, however, are undoubtedly slowed in the lung capillaries, cling to the side of the vessel walls and, because the *treponema pallidum* are always attempting to leave the circulation for extravascular tissues, in which they are less liable to injury, penetrate into the interstitial portions of the lung.

Those that do penetrate the lung parenchyma, in their attempt to get far away from the blood stream, will not under ordinary circumstances remain there for any length of time. First, they do not like the proximity to oxygen; second, many will be phagocyted by the alveolar epithe-

lium, which is mesothelial in origin and a part of the reticuloendothelium; finally, and what is more important, the spirochetes will be taken up rapidly by the lymphatics and drain into the hilus nodes, due to the great drainage power of the lungs in ridding themselves of foreign and undesirable particles.

A similar process is seen in the handling by the lungs of the tubercle bacillus, in the storage of coal pigment and silica in the hilus nodes and in the remarkable lymphatic drainage seen in malignancy of the lung.

The lungs eventually rid themselves of the spirochetes by way of their lymphatics, which drain to the peribronchial and regional nodes of the mediastinum. These become collecting stations, or reservoirs, for the storage of spirochetes. Here they are exposed to the phagocytic action of the reticuloendothelial cells of the lymph-sinuses.

I am of the opinion that the above conception explains the rarity of pulmonary syphilis. It is a notable fact that in acquired syphilis, gummata of the lungs are unusual. The various forms of pulmonary syphilis described by clinicians and roentgenologists and seldom substantiated at autopsy, have usually been of the hilus type. A diffuse, fibrotic infiltration forms a doubtful and nebulous pathological entity.

Furthermore, it is of interest to note, that the only common form of lung syphilis is that seen in stillborn infants, or in those who live only a few days, in which the well known "pneumonia alba" is encountered. Microscopic examination of these lungs show chiefly an arrested development rather than an active inflammation, with considerable cellular fibrous tissue about the blood vessels.

In heredosyphilis the child is infected through the placenta, and an incalculable number of spirochetes circulate throughout most of the organs, the number having no parallel in acquired syphilis. The rarity of heart disease in congenital syphilis might be explained, therefore, by the fact that the lungs of the fetus have escaped the large

dosage of spirochetes, because the fetal circulation does not pass through them to any great extent.

In instances in which the lungs receive an unusual dose, a fatal pneumonia alba occurs, principally because the lungs are not aerated and offer a more favorable soil for the reproduction of spirochetes than do the adult, oxygen containing, lungs.

THE HEART

In the septicemia stage, spirochetes undoubtedly reach the heart muscle in considerable numbers by way of the coronary circulation.

Does syphilis of the heart muscle begin in this stage?

Warthin's observations led him to conclude that in the second stage of syphilis there is a very active specific infiltration of the heart muscle.

Clinically, it is well known that various cardiac disturbances take place during the early stages of syphilis, such as, tachycardia, bradycardia, arrhythmias and syncope. It is doubtful, however, whether these are due to a true specific myocarditis.

It is obvious that this question is very important. If there is a specific myocarditis in early syphilis, there is a foundation laid for the various forms of myocardial syphilis said by Warthin to occur in the later stages of the disease. (Active syphilitic myocarditis, chronic syphilitic myocarditis and fibroid myocarditis with acute exacerbation).

I am of the opinion that the heart muscle is not favorable soil for the growth of *treponema pallidum*. Because of the firm, ceaseless contractions, it is too active a place. The oxygen content is too high. I believe the strong muscle contractions favor lymphatic drainage towards the aortic arch and help in ridding the myocardium of the organisms.

Those remaining and surviving may rest for many years without doing appreciable damage. The finding, therefore,

of a *spirochete* in the heart muscle in late syphilis, perhaps surrounded by a few lymphocytes, may mean nothing more than an insignificant historical landmark. In a similar manner spirochetes may often rest in the skin of latent syphilitics, leaving no gross, and little microscopic evidence of their presence. Yet syphilis may be transmitted to rabbits by inoculation.

It is of interest to note that very few have ever been able to find spirochetes in the myocardium in acquired syphilis, although most careful and painstaking technic has been used. Furthermore, in using the Warthin-Starry technic, it has been repeatedly shown that artifacts indistinguishable from spirochetes may be obtained by staining cover slips alone, without any tissue.

Saphir³ in a review of the recorded cases of syphilitic myocarditis in literature states: "A critical consideration reveals that morphologically the diagnosis of syphilitic myocarditis cannot be made in any of the reviewed cases without the presence of gummas." Furthermore, perivascular infiltrations of lymphocytes in the myocardium; lymphocytes, plasma cells and endothelial cells in the interstitial tissue; and polynuclears may be found in the myocardium in cases of coronary sclerosis especially in cases in which there has been infarction and in cases of rheumatism and other infections. They are not pathognomonic of syphilis.

THE NERVOUS SYSTEM

In the stage of spirochetemia, innumerable spirochetes reach the brain by way of the carotid circulation.

Many of these eventually reach the pia-arachnoid, chiefly over the base of the brain. Reproduction is followed by the characteristic, cellular reaction.

Even as early as the stage of the chancre, an increase in the cell count of the spinal fluid may occur, denoting the existence already of an exudative process in the leptomeninges.

In the secondary stage, spirochetes have been found in the spinal fluid, both by inoculation and the microscope.

While infection of the nervous system is common and occurs early in the disease, the actual development of syphilitic disease is much less so, and only around 20 per cent of all syphilitics show during their disease meningovascular symptoms.

That all syphilitics do not develop neurosyphilis, tabes or paresis is due to many factors, such as dosage, resistance of host, immunity, and possibly differences in strains of organisms.

The common location for early neurosyphilis is over the base of the brain, where when the lesion is visible, a gelatinous exudate is seen over the interpeduncular spaces, or a milkiness so slight that it may easily be overlooked. This location accounts for the early involvement of the third, fourth and sixth cranial nerves with symptoms of diplopia, strabismus, etc.

The manner in which the spirochetes gain access to the subarachnoid spaces over the base of the brain is of great interest.

In tuberculous meningitis the tubercles are located, chiefly, in the Sylvian fissures along the course of the middle cerebral arteries. For years they were interpreted as hematogenous in distribution, springing from the vessels of the pia-arachnoid. While this appeared plausible, it has for many reasons, never satisfied critical pathologists.

Rich⁴ then demonstrated, experimentally, that the meninges could not be infected by direct injections of tubercle bacilli into the carotid arteries, but typical tuberculous meningitis could be produced by subarachnoid injections. He regarded a primary infection of the choroid plexus, a hematogenous one of course, as the essential factor in the production of tuberculous meningitis, the bacilli entering the interventricular fluid and finally reaching the subarachnoid spaces over the base of the brain.

Lewkowicz⁵ called attention to the same mode of infection in meningococcus meningitis.

I am of the opinion, that the same anatomical route occurs in syphilis, the spirochetes entering the lateral ventricles by way of the choroid plexuses. Because of the large size of the ventricles, their smooth walls and the downward flow of spinal fluid, the spirochetes are rapidly washed out of the ventricular system into the basal cisterna where they finally lodge in the quiet and restful interstices of the subarachnoid spaces over the base of the brain.

Such a conception best explains the location of early neurosyphilis and the logical development from it of meningoencephalitis and general paresis. In paresis, the granular ependyma of the lateral and fourth ventricles is pathognomonic, a heaping up of neuroglia proliferation probably due to spirochetal rests which have been caught in the ependyma.

Such a conception warrants careful histological study of the choroid plexuses in this disease, which seem to have been overlooked.

LATENT STAGE

In the latent stage of syphilis, the organisms are held in check by the local and systemic defense, the innumerable, minute, imperfectly healing foci producing immunity.

Local foci may flare up at any time, discharging a shower of spirochetes into the circulation, or into a lymphatic drainage area. Reinfection takes place, followed usually, by reproduction, typical lymphocytic cellular reactions, with consequent fibrosis and suppression of the infection. In many of these foci all the spirochetes are not killed and relapses occur.

This flareup of partly extinguished foci with consequent imperfect healing and vascular changes, results in damage to the surrounding tissues and parenchyma and the most dangerous stage of syphilis, the degenerative phase begins.

The clinical picture of this latent stage is usually characterized by prolonged absence of symptoms. Relapses are

characterized by fewer, more localized and destructive lesions due to the pronounced vascular changes and possibly to allergy. Spirochetes are scant in number and the patient is clinically not infectious.

LATE SYPHILIS—GUMMATOUS STAGE

In late syphilis, due to the allergy or hypersensitiveness, and especially to the chronic vascular changes, gummas are prone to develop.

Gummata are gummy, tumor-like masses varying in size from those just visible to larger masses several inches in diameter. They are not to be confused with the miliary gumma. They may occur in any organ or tissue.

They contain very few spirochetes and the lesion is not clinically infective. They are circumscribed and composed of granulation tissue with a center of caseation due to ischemia produced by the obliterating endarteritis. There are collections of lymphocytes and plasma cells around the center of caseation, together with a few giant cells. On the edge, proliferating fibroblasts and a definite fibrous capsule may be noted. The result is extensive sloughing with destruction of parenchyma and enormous scarring.

On account of their size, gummata usually produce symptoms and are easily diagnosed. They are consequently becoming less frequent.

Gummas are more likely to be encountered in the brain, where on account of their size, they must be differentiated from other cerebral tumors; in the calvarium, where they cause extensive destruction of the skull, fortunately infrequently seen, nowadays; in the larynx, where they produce hoarseness and sometimes cause death from asphyxiation; in the mediastinum, where they represent the only common form of thoracic syphilis; in the lung, where they are infrequent; in the liver, where they lead to extensive destruction with the production of the well known *hepar lobatum*; in the heart muscle, where they are rare, being only seen in large autopsy services and usually occurring on the in-

terventricular septum; in the testes, where they have often been erroneously removed for malignancy; in the rectum, where they produce strictures; in the bones, commonly in the tibiae, where they must be diagnosed from other bone tumors; and in the skin, usually over the legs, where they may produce extensive ulceration and scarring.

LATE SYPHILIS—DEGENERATIVE STAGE

Syphilis is frightful, not because of destructive lesions of the skin and bones, but because of the late, insidious complications.

From 10 to 15 to 20 years after the infection, when the patient has forgotten all about his disease, after years of apparent health, and at the age when he is carrying his heaviest responsibilities, he is suddenly confronted with the fact that he has been gradually developing a serious, irreparable, and eventually, fatal disease of his nervous and cardiovascular systems.

This degenerative stage is the result of the imperfect healing of the innumerable, metastatic, miliary gummata which occur throughout the disease, in any organ or tissue of the body.

The small, microscopic perivascular collection of lymphocytes and plasma cells forming the miliary gumma is the characteristic histological unit of syphilis, as is the tubercle in tuberculosis and the submiliary tubercle in rheumatic fever.

Due to imperfect healing and incomplete sterilization there is a constant flaring up of these foci throughout the disease. New adjacent and far distant foci are formed by reinfection. Reproduction, a cellular defense reaction, fibrosis and imperfect healing take place. In time this vicious cycle causes irreparable damage to the parenchyma and surrounding body tissue. Serious disease, especially of the nervous and cardiovascular systems, results.

In the nervous system, the early neurosyphilis, if not cured, may become markedly meningoencephalitic in type

and paresis develops. In this disease, the spirochetes become very numerous, unlike that in any other late lesion in syphilis. Or tabes may develop, usually due to this same gummatous infiltration of the posterior ganglia, the changes in the posterior columns being entirely those of secondary degeneration. Hence, spirochetes are very scant in the cord.

SYPHILIS OF AORTA AND HEART

In syphilis of the aorta and heart the main lesion is usually in the first portion of the aortic arch.

During the stage of spirochetemia, we have already noted the countless metastatic foci established in the skin of the entire body (as manifested by the rash), in the mucous patches in the mouth and pharynx, and over the genitals. About each focus, reproduction takes place, characteristic cellular reactions and then subsidence and healing. On healing the remaining spirochetes drain into the regional lymph-nodes. From the face, mouth, throat, chest and upper extremities the final drainage must be into the mediastinal nodes.

Furthermore, this is augmented by the drainage into these same nodes of the spirochetes coming from the lungs.

The hilus and mediastinal nodes then become, in fact, the largest and most important group of nodes draining spirochetes from the parenchymatous organs and tissues and the largest collecting stations or reservoirs for the storage and destruction of spirochetes.

The lymphatic network leading to these glands and away from them is enormous. The moving of the parts during respiration, greatly increases the possibility of retrograde lymphatic permeation and embolism. Although some pathologists ridicule retrograde lymphatic drainage, it is a well established mode of metastasis in cancer.

The most important retrograde extension from these nodes would be to the first portion of the aorta.

The main and most important lesion in nearly all cases

of acquired syphilis of the aorta is a supravascular sclerosis. Most of the other changes and phases of cardiac syphilis depend upon this lesion.

The earliest lesions are microscopic and occur around the vasa vasorum in the adventitia of the root of the aorta where there is seen a collection of lymphocytes and plasma cells, lying, probably, in the perivascular lymph-spaces. Stained sections may show spirochetes in these areas, but usually they are found with difficulty. Small, miliary gummata are formed in the adventitia.

There follows a secondary invasion of the media with consequent breaking up of elastica and weakening of the vessel wall. Obliterating endarteritis of the vasa vasorum is common. The lesion develops to a stage at which it can be recognized with the naked eye. The earliest patch is usually triangular and situated just above the commissures distal to the attachment of the aortic cusps. The base of the triangle is usually pointed upward. There is a gray or slightly yellowish elevation with steep edges, rubbery and smooth on top, but marked by shallow, parallel or stellate furrows.

The process spreads in a horizontal manner around the root of the aorta (girdle of Venus). Distally it often extends to the mouths of the great vessels springing from the aortic arch. The orifices of these arteries may often be narrowed to a marked degree. The sclerosis may diffusely involve the whole aortic arch and extend into the thoracic aorta.

Histological study shows that the gummatous process starting and most pronounced in the adventitia, has infiltrated the media, breaking up and pushing aside elastic fibers, and has gained access to the subintimal tissue of the aorta where there is less resistance to further infiltration.

I speak of the whole process as a sclerosis because the lesion found at autopsy is in the nature of a deforming

scarring defect, due to the insidious gummatous infiltration, with imperfect healing and fibrosis.

Acquired cardiac syphilis is, therefore, essentially a supralvalvular sclerosis which may manifest itself in one or more of the following ways:

The first, most frequent and most dangerous is the production of an aortic regurgitation. In my series⁶, aortic regurgitation occurred in about 60 per cent of syphilitic aortitis which result in death (combined hospital and medical examiners' cases), and in 36 per cent of cases of sudden death due to syphilis of heart and aorta.

The regurgitation was always a secondary extension from a syphilitic aortitis and usually occurred as the result of a descending process. Extension of the syphilitic gummatous process through the media into the subintimal spaces producing the triangular patches, continues in the direction of the attachment of the aortic cusps, usually following the lines of least resistance, which is alongside of and between the fan-shaped subintimal fibers, the remnants of those fibers forming originally the aortic cusps.

The result is a pushing apart of the cusps at their attachments by the gummatous and sclerosing process. Sometimes the attachments of the cusps may be separated by at least 1 cm. Often, just a furrow exists between the attachments of the adjacent cusps, which are thickened and infiltrated. This widening of the commissures is the earliest sign of aortic regurgitation, and is practically the main factor in its production.

The aortic valve may also be attacked by the gummatous process ascending through the sinus of Valsalva. In this process only the aortic layers of the cusps will be involved.

The syphilitic lesion does not as a rule reach the free edges of the valves. The characteristic thickening and rolling of the free edges of the cusps in syphilis is a functional adaptation to the primary dilatation of the aortic ring

and the thickening is a functional marginal sclerosis made worse by the mechanical effect of the regurgitant blood stream. The endocardial thickenings on the interventricular septum below the cusps is also mechanical due to regurgitant stream.

The aortic regurgitation is often combined with narrowing or atresia of the coronaries, and it is sometimes superimposed upon an old aortic aneurysm.

The heart nearly always shows marked hypertrophy and often dilatation, especially of the left ventricle.

The main myocardial lesion is hypertrophy, seen on gross and microscopic examination. Other lesions are infrequent and of no great significance.

The irreparable sclerotic lesion is not as a rule favorably influenced by specific treatment. Sudden death is due to acute dilatation or to an anginoid type of failure when the coronaries are involved. When death is delayed it is usually due to failure of the congestive type.

As a rule patients do not survive a two-year period after the diagnosis is made. Exceptional cases may live for many years.

The second main danger of syphilitic supravulvar sclerosis is stenosis and atresia of the coronary arteries. In my series this occurred in about 30 per cent of syphilitic aortitis resulting in death and in about 15 per cent of sudden death due to syphilis of aorta and heart.

The process is always a narrowing, often to complete atresia, of one or both arteries, due to encroachment upon their orifices in the aortic wall by the syphilitic process. Syphilis of the coronaries beyond the aortic wall is rare if we exclude a small amount of adventitial gummatous infiltration which spreads down from the aortic wall and is rarely seen over 1 cm. beyond the orifice of the artery.

If the coronary orifices are congenitally high placed above a base line drawn through the upper attachments

of the aortic cusps, they are much more liable to narrowing than if they arise normally in the sinuses of Valsalva.

The heart is usually normal in size, or occasionally slightly enlarged in the pure forms of this lesion. The muscle is quite normal in appearance and usually shows no evidence of any specific myocardial lesions. Occasionally an inanition atrophy similar to brown atrophy is seen.

Unlike coronary occlusion in arteriosclerosis, in syphilis the process is a very slow and gradual one. Compensatory circulation is often established and keeps the individual alive and often in apparent health for a long time, even with both coronaries completely occluded, when the thebesian circulation supplies the heart muscle.

Myocardial infarction, therefore, practically does not occur in these cases and its absence is almost pathognomonic.

Sudden death is difficult to explain on account of the long duration of the stenosis. Physical strain, fright, emotions, etc., seem to play an important rôle. Syphilitic angina usually occurs in this type of case and not in other forms of cardiac syphilis. It is usually anginoid with atypical symptoms, but sometimes resembles the angina of arteriosclerosis, and even an occlusion in rare instances.

Specific treatment in these cases is usually contraindicated, because of the danger of a Herxheimer reaction or too rapid healing causing a therapeutic paradox.

The third main danger of syphilitic supra-avalvular sclerosis is aortic aneurysm. In my series, this occurred in 10 per cent of cases of syphilitic aortitis resulting in death but was the most common cause of sudden death, being the direct cause of death in about 37 per cent of medical examiners' cases.

The aneurysm is due to weakening of the aortic wall by the syphilitic, gummatous infiltration. A high maintained diastolic pressure, when the aortic valve is not in-

volved and there is no regurgitation, is usually the important factor in the aneurysmal dilatation.

Cases of long duration are frequently associated with a regurgitation which has been superimposed after the aneurysm has existed for many years.

If there is no regurgitation and the aneurysm is not near enough to the aortic ring to produce dilatation, the heart is usually normal in size, or only moderately hypertrophied.

Death is usually sudden and due to rupture. If the coronaries are involved it may be sudden with, or without, anginoid symptoms. Slow death is due to failure of congestive type, or is a result of pressure on the surrounding structures.

Pain, the main symptom, can often be relieved by proper specific treatment, although the physical signs may increase. Specific treatment is less dangerous and gives better results than in regurgitation or coronary stenosis.

OTHER ARTERIAL LESIONS

Of all the arteries, the aortic arch is the chief location for miliary gummatous lesions in late syphilis. The process in the aorta often reaches the great vessels of the aortic arch and produces a narrowing of their orifices.

Syphilis also is fairly frequently seen in the carotid arteries, and carotid aneurysms are by no means rare. This should be expected when we recall the lymphatic drainage from the neck and nasopharynx in syphilis, towards the mediastinum by way of the deep lymphatics. Typical lesions in the femoral arteries have been noted but they are of less frequent occurrence.

It is extremely rare to see a gangrene of the lower extremities which could be definitely laid to syphilitic arteritis. This is accounted for by the fact that the spirochetes from the skin rashes and lesions on the legs drain by way of the superficial lymphatics to the inguinal nodes and away from the peripheral arteries of the legs.

Syphilis is frequently seen in the cerebral arteries as a periarteritis, and because of the small caliber of the vessels, an added obliterating endarteritis is liable to produce thrombosis rather than aneurysm.

It may be stated, therefore, that aside from the aortic arch and the cerebral arteries, syphilis plays very little part in lesions of the other arteries.

OTHER INTERSTITIAL AND DEGENERATIVE LESIONS

An interstitial form of pulmonary syphilis, although reported by many clinicians and roentgenologists, is an uncertain diagnosis at autopsy, and as Boyd⁷ states, forms one of the most nebulous pathological entities.

Hepatic syphilis in the form of an interstitial cirrhosis is another doubtful pathological entity, the main lesion in the liver being one of multiple large gummas with extensive scarring (hepar lobatum).

An interstitial form of syphilitic orchitis occurs quite frequently, and is much more common than the gumma of the testes. It is often seen at autopsy as the only historical landmark of syphilis and demonstrates the necessity of the routine examination at autopsy of the testes. The testicle on cut section shows pale, grayish, hyaline streaks, sometimes none of the brownish parenchyma being visible, and the tubules string out with difficulty.

Occasionally a splenomegaly is seen in late syphilis, associated with a positive Wassermann and an anemia, the clinical picture being indistinguishable from Banti's disease. In these cases, there is no improvement after anti-luetic treatment unless the spleen is removed surgically, the spirochetes seeming to be locked up in the diffuse fibrosis and resisting destruction by treatment. Some authorities have stated that the Banti's syndrome is always syphilitic, but this must be incorrect.

SUMMARY

The development of syphilitic destructive lesions in the nervous and circulatory systems has been given in a

sketchy way outlining certain theories which have appeared to be as near the correct interpretation as we can attain by our present knowledge.

From a clinical and pathological standpoint, I believe that we should regard syphilis of the aorta and heart as an acquired disease (congenital cases being rare) developing insidiously and showing symptoms years after the initial infection.

Death in acquired syphilis of the aorta and heart is almost always due to an aortic regurgitation, or to narrowing or atresia of the coronary arteries, or to the production of an aortic aneurysm, or to any combination of the three great dangers of syphilitic aortitis. Death is due occasionally to unusual lesions caused by syphilis, such as spontaneous rupture of the aorta, dissecting aneurysm, isolated gumma of the heart muscle, miliary aneurysms, etc.

Specific lesions of the myocardium and of the coronary arteries beyond the aortic wall are infrequent, they have been greatly exaggerated, and when they occur are so slight in extent as to be of little practical importance. They rarely embarrass cardiac action, are insignificant in the production of cardiac failure and the slower modes of cardiac death, and are of little importance in explaining sudden death.

The myocardium in syphilis is frequently normal. When the aortic valve is involved, the main myocardial lesion is hypertrophy. Inanition atrophy is occasionally encountered when there is a slow stenosis and atresia of both coronary orifices. Specific lesions of the myocardium are rare, and, when they occur, are slight in extent and of little practical importance.

It is safer and better to assume that the coronaries distal to the aortic wall are usually normal in pure, uncomplicated syphilis, and that coronary occlusions, anemic infarcts, necrosis of heart muscle, replacement fibrosis, aneurysms of ventricular walls, and fibrous myocarditis are almost entirely due to coronary injury dependent upon an

arteriosclerotic process and have nothing to do with syphilis. That rheumatism and other infections produce forms of interstitial myocarditis is obvious. But it appears that syphilis does not play an important rôle in the production of such lesions.

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GENERAL DISCUSSION

HARLOW BROOKS

New York

I am sure that we have all enjoyed the papers of this evening very much, and as for myself, I am certain that I have profited greatly by them. I have been particularly charmed by the splendid presentation which Dr. Martland has made concerning the pathology of vascular syphilis, a subject in which I have been very much interested for many years.

In this regard I wish especially to commend the beautiful slides and charts which Dr. Martland presented, tho I was much distressed to have him pass over without comment and rapidly, a slide which showed most beautifully the syphilitic changes produced in the myocardium, a subject which I regret Dr. Martland has failed to study with his usual care and fair mindedness. I am certain that the manes of Dr. Warthin would have been horribly shocked had they heard the cursory way with which Dr. Martland looked on this one phase of the subject, for he is so broad, so convincing and so thoro in all the other phases of the subject.

For many years it was my privilege to visit the luetic cases under the charge of the late Dr. Fordyce at the City Hospital, a service which adjoined my own service in Medicine, and I also during the early period of the War had under my frequent observation all the cases of primary and secondary lues which entered the Base Hospital at one of our large mobilization camps. Altho my practice now rarely comes in contact with cases of either primary or secondary lues, I feel that I am still justified in speaking with some assurance as regards the cardiovascular changes in this phase of syphilis also.

I have never seen a single instance in which cardiovascular symptoms or pathology became evident in, or were exaggerated by, primary syphilis. Cardiovascular changes in secondary lues are also exceedingly infrequent as compared to their occurrence in the late phases of the disease. None the less Carroll and I collected some 41 instances of such disease some years ago. Three of our cases terminated fatally very much after the manner of the cases in this stage which have been cited by Warthin, Wile and Stokes.

I am convinced that proper anti-syphilitic treatment of the primary and secondary stages of syphilis prevent the appearance of serious cardiac lesions due to syphilis in almost 100 per cent of instances. Because of what has been said this evening, however, I must point out the well accepted fact among clinicians that arsenic is a very dangerous drug to employ in cardiovascular syphilis except in instances which have previously been brought very well under the effects of those other still potent, tho old, specifics in this disease, namely mercury, the iodides and more recently bismuth.

Surely no one who has seen the remarkable lesions which Dr. Martland's slides exhibited tonight can expect any drug to perform miracles and save life when such extensive and vital damage has been committed as was shown in the slides of this evening. There can however remain little doubt in the minds of those clinical students who have conscientiously employed proper therapeutic measures in the secondary and early tertiary stages of cardiovascular syphilis, who can fail to feel that such cases properly treated probably represent the most definitely curable form of heart disease with which we are familiar.

Dr. Martland has most brilliantly demonstrated the character and gravity with which late syphilis affects the aorta. If as he apparently feels, muscular syphilis in so far as the heart is concerned, is unusual, it is very difficult to explain the clinical results which competent clinicians obtain in the management of most relatively early clinical

evidences of cardiac syphilis and even in many of the late stages which one meets in practice.

Death from aortic disease is a difficult phenomenon to explain on a logical basis from purely aortic lesions in syphilis if we must assume that the myocardium possesses the strange and unique immunity against the infection which would then represent in so far as I know, about the only tissue in the body of mesodermal origin which is not involved in this protean infection. To me as a clinician and as a some time pathologist, the symptoms manifested in most cases of cardiovascular syphilis are those of myocardial involvement in association, it is true, usually with more or less aortic disease.

I again wish to express my indebtedness to the speakers of the evening, and particularly to Dr. Martland, my friend and opponent, and also especially to the very clear and helpful discussion of the new treatment of cerebro-spinal syphilis, which has been so splendidly presented tonight by our colleague from Harvard University.



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DEATHS OF FELLOWS OF THE ACADEMY

CHARLES AUGUSTUS LEALE, M.D., 1261 Madison Avenue, New York City; graduated in medicine from Bellevue Hospital Medical College, New York City, in 1865; elected a Fellow of the Academy December 2, 1869; died, June 13, 1932. Dr. Leale was a Fellow of the American Medical Association, a member of the American Society for the Advancement of Science, a member of the County and State Medical Societies, a member of the Neurological Society and Consulting Physician to Bellevue and Allied Hospitals. He was the oldest Fellow of the Academy.

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EDITORIAL

FONTENELLE AS A POPULARIZER OF SCIENCE

(WITH A VERSION OF HIS DIALOGUES OF MEDICO-HISTORICAL INTEREST).

Never has the literature of popular science, or, as some will have it, its vulgarization, attained to such an extraordinary proliferation as during the period in which we are now living. Familiarity with the book-stalls or the weekly current lists of new books will convince any one that there must be literally hundreds of popular treatises on evolution, on the descent of man, on eugenics, personal hygiene, first aid, domestic medicine, psychology, psychoanalysis, endocrinology, industrial chemistry, natural history, relativity, and latterly even a few on history of medicine. There are actual specimens of irresponsible improvisation so misleading and inaccurate as to be virtually comic histories of some phase of science or of medicine. Between this *infima species* and that which springs from an honest attempt to convey scientific information in an exact, simple, lucid manner, there must needs be a great gulf fixed; but, as familiarity breeds contempt, the descent to the lower level is none the less facile, and sometimes inevitable.

The cult of popular science had its vague beginnings in the 17th Century, when the scientific society, one of the special creations of the period, was patronized by royalty or the nobility. The Royal Society was chartered by Charles II, who himself dabbled in chemistry. Back of

the Académie des Sciences (Paris) stood Louis XIV, back of the Roman Academy of Lynxes, Count Federigo Cesi, back of the Academy of Experiment of the same city, the Medici, while out of Prince Rupert's laboratory came "Prince's metal" and "Prince Rupert's drop." As the power of the middle classes grèw apace, universities, such as those at Leipzig, Halle and Leyden, came to be created by popular *fiat*. The oldest scientific society in Germany, the Leopoldine Academy (1651), which antedates even the Royal Society, was founded, in fact, by a group of medical men. As medical societies increased in number, there was a corresponding increase in the number of medical periodicals. All this was part of the 18th Century program of "enlightenment" by dissemination of knowledge among a cultivated intelligentsia; but, in practice, the old 17th Century tradition still held. The intelligentsia constituted a virtual intellectual despotism, centering in the king, and where science was popularized, it was merely as a kind of pap or predigested food for people of fashion. The more democratic phase came from England and sprang from what has been called the "sublime error" of Anglo-Saxon tradition, the propensity to make one's neighbor better (if possible) than oneself. Faraday is known to have got his youthful incentive to a scientific career from certain "Conversations on Chemistry" (1806) by Mrs. Alexander Marcet, wife of the well known physiological chemist and pioneer authoress of a long row of rudimentary scientific primers for women and children. From all this came Faraday's lecture on The Candle¹; John Tyndall's lectures and "Fragments of Science for Unscientific People" (1871), which ran through six editions; Huxley on Coral, Yeast, A Piece of Chalk and The Descent of Man; perhaps even the phenomenal sale of the entire first edition (1250 copies) of Darwin's Origin of Species on the day of its publication (November 24, 1859). Popular scientific lectures and essays now became the vogue and even Helmholtz, Haeckel, Virchow, Du Bois Reymond, Mach and Ostwald took a hand in a department of literature in

¹ Published 1865.

which Flammarion, Le Dantec, Grasset, Leduc, Wallace, Ray Lankester, Haldane, Whetham, Soddy, Lodge, Wells, Slosson, Jeans and Eddington are familiar names. Popular scientific lectures for the people, such as those of Huxley to the working classes or the "Saturday Lectures" at Washington, D.C. (1882), became fashionable. During 1866-1902, in fact, up to his death, Virchow edited a serial comprising scientific lectures to be "understood of the people" (*Sammlung gemeinverständlicher wissenschaftlicher Vorträge*). The number of popular books on medicine and biology is legion. Dry husks to chew are sometimes dispensed by the movies or radio. But it is still a far cry from Joseph Cook or Jules Verne to Huxley's Piece of Chalk or Willard Gibbs on Multiple Algebra.

In the highly artificial civilization of 18th Century France, there was a deliberate, and by no means ungenial attempt to popularize science as a cult among the more intellectual members of polite society. The aim was to prepare the ground for enlightenment, to accelerate the credited perfectibility of the human species by the creation of a sympathetic audience. The supply of such literature implied, not so much a demand, as a receptive spirit, like that accountable, a little later, for the spontaneous appreciation of Beethoven's music by the *élite* of Vienna. Molière's *Les Femmes Savantes* is not a farce, but a true picture of 17th Century manners. In Molière's time, it was no shame but rather a matter of emulation for a lady of fashion to be a bluestocking. On the eve of the French Revolution, André Chenier satirizes Mme. du Genlis (daughter of Louis XIV and Montespan) for her school-marm attitude toward her social equals—

"J'arrive d'Altona pour vous apprendre à lire."

But the concern of fashionable bluestockings was not science but polite literature. Newton, Harvey, Sydenham, Descartes were little known or appreciated until the 18th Century, when science began to come into its own and got its innings, if not its ultimate stride. The prime-

mover of this change in France was Fontenelle,² Perpetual Secretary of the Académie des Sciences and the logical precursor of Voltaire, very much as Darwinism culminated in Nietzsche.

Fontenelle was born at Rouen on February 11, 1657 and came within a month of dying a centenarian (January 9, 1757). His father was an advocate, his mother a sister of the poet Corneille. Bred to the law, young Fontenelle lost his first case, probably as a pretext for taking up literature, which ran in the family. All his plays and operas were flat failures on the stage; his pastorals and amatory verses merely insignificant specimens of the affected fripperies of the period. In the memorable judgment of Swinburne about the literature of the dying century, "they are not simply dull; they are null." In *Lettres galantes*, Fontenelle even made a bid for coin and *kudos* by playing up to the growing corruption of the time. A young wife, clandestinely married, is counselled to profit by her dual rôle in a manner adjudged *saugrenu* by actual patrons of frivolity themselves. As whilom editor of the rapid *Mer-cure galante*, Fontenelle, the canny, provincial Norman, was the laughing stock of all clever people in Paris. It was not until 1683, that he found his true vein and established his reputation by his *Dialogues of the Dead*; a reputation considerably enhanced, three years later, by his *Conversations on the Plurality of Worlds* (1686). With characteristic Norman shrewdness, Fontenelle had remained in his native Rouen until his Parisian success was assured. He now went up to Paris to publish his *History of Oracles* (1687), which occasioned ominous rumblings, both in philosophic and theological circles. His thesis is to deny

² The best full-length biography of Fontenelle is that of Louis Maigrón (Paris, 1906). A briefer eulogy was published at Paris in 1847 by the physiologist M. J. P. Flourens, who was his sole successor in the unique office of Perpetual Secretary to the Academy of Sciences. As an all-round literary estimate, the *causerie* of Sainte Beuve (*Causeries du Lundi*, III, 314-335) still remains unsurpassed. For the loan of these and of other volumes from the collective Œuvres of 1757, I am indebted to the kindness of Professor Chinard, of the Johns Hopkins University.

that oracles were of supernatural origin and that they ceased to function after the birth of Christ. In this book, the most favorable specimen extant of his clear, precise mode of expression, Fontenelle definitely established his position as a scientific writer, in other words, as an 18th Century rationalist. As Sainte Beuve observed, there were two Fontenelles: the one, an affected 17th Century *bel esprit*, who wrote faded, insipid pastorals of the type ridiculed by Molière; the other the serious, impersonal disciple of Descartes, who had outgrown these fripperies, and become, incidentally, the ablest expounder and recorder of science in his time and place. In the face of the determined opposition of Boileau and Racine, Fontenelle now gained entry to the French Academy, later to the Academy of Inscriptions and the Academy of Sciences (1697), of which he was made Perpetual Secretary in 1699. The day after his appointment, he set to work upon the great History of the Academy of Sciences, the permanent record of its transactions, of which the initial volume appeared under his editorship in 1702. To pure science, Fontenelle contributed a Geometry of the Infinite and an Apology for (Cartesian) Vortices. Of the former, he observed that it could be understood by eight Europeans only, and "the author is not one of the eight." His most solid contributions are his prefaces to the History of the Academy and his Eulogies of its deceased members. These are remarkable for simple, accurate presentation of fact, notably of the essential argument of Newton's *Principia*. Fontenelle wrote 17 eulogies of deceased medical men, who were members of the Academy, and as these have never been indexed by medical bibliographers, the pagination in his *Œuvres* (Paris, 1767, V-VI) is subjoined, viz:

Claude Bourdelin (1621-99), V, 48-50; Daniel Taurvy (1689-1701), V, 50-54; Adrian Tuillier (1674-1702), V, 54; Denis Dodart (1634-1707), V, 190-210; François Poupart, V, 252-258; Claude Bourdelin (1667-1711), V, 312-318; Claude Berger (1679-1712), V, 319-322; Louis Morin (1635-1715), V, 380-389; Nicolas Lemery (1645-1715), V, 389-406; Guy-Crescent Fagon (1639-1718), VI, 34-36; Jean Mery (1645-1722), VI, 168-181; Alexis Littré (1658-1725), VI, 248-261; Guichard-Joseph du Verney (1648-1730), VI, 448-464; Estienne-François Geoffroy (1672-1731), VI, 487-500; Frederic

Ruysch (1638-1731), VI, 501-518; Pierre Chirac (1650-1732), VI, 524-544; Herman Boerhaave (1668-1738), VI, 601-623; also an eulogy of the medical botanist Joseph-Pitton de Tournefort (1656-1708), V, 210-232.

In the end, Fontenelle made himself the most popular and respected Parisian of his period, through his urbanity, his social tact and finesse, his wit and sense. While gallant, assiduous and flirtations with women, he was esteemed cold and heartless, incapable of passion or sentiment, by those in the know. The reason for all this is not far to seek. In his childhood, he had exhibited consumptive tendencies, spat blood when excited, and had to cope all his life with bouts of hæmoptysis. To ward off permanent invalidism, he therefore deliberately shut out of his life all sources of worry and emotional excitement, until settled habit became second nature. Like the bored lady in the Russian novel, his watchword was: *On veut troubler ma vie*. In keeping with this aristocratic social poise and self-possession, he smiled occasionally, but never laughed, cried or got angry. That he should have lived to be a hundred under this studious régime constitutes a triumph for the disciples of Cornaro. Fontenelle's case illustrates the dictum of Allbutt that health is really a diathesis, like tubercle or syphilis, and is more popular than the rest simply as being the most viable and useful. A life regulated by régime, said La Rochefoucauld, is but a tedious mode of disease. But, as in Lord Bacon's case, Fontenelle was saved from any misgiving or repining by the mental indifference, the "minimum of intellectual eagerness," which goes with lowered vitality. Thus he attained to cold, clear thinking, well-poised, unbiased judgment, utter detachment from prejudice, *parti pris* and narrowminded clansmanship, thence to balance and precision in writing; and, like Goethe and Landor, declined to be at odds with any man. The same impersonal poise, the same accuracy of perception, is noticeable in all the great philosophers of celery stalk vitality, from Spinoza to Kant, from Locke to Stuart Mill and Emerson. The high spots of Fontenelle's wit are his reference to the valetudinarian aspect of his personal purity (*quelquefois le matin*) and his well

known assertion that were all essential truths contained within the hollow of his hand, he would take care never to open it.³ He winds up his eulogy of Newton by stressing the large fortunes left by Newton and Leibnitz as a fact of unique respectability and distinction in the total history of science. He himself died passing rich on 21,000 livres (\$5000) income, 80,000 livres ready money, a furnished house and a fine library; all acquired from royalties on his writings alone.⁴ As Fontenelle grew older, he became more and more enamoured of tranquillity, declined titles, dignities and honors, and would accept naught but a lodging in the Palais Royal from the Regent himself. When offered the Perpetual Presidency of the Academy of Sciences, he exclaimed: "Ah! do not deprive me of the comfort of being on equal terms with my fellows!" His trait of treating every woman he met as if she were, for the time being, the only person in the world, insured him a large following of female admirers and his domestic interior never lacked the feminine touch. A French refugee who visited him in 1733, records:

"M. de Fontenelle is magnificently housed; he seems much at his ease, richly endowed with Dame Fortune's gifts. Advanced as he is, in years, the glance of his eyes is lively and subtle. One can see that Nature fashioned this great man for a pleasurable existence."⁵

In such wise, Fontenelle kept his state. Even at this long stretch of time, his name connotes the faint aroma, the faded charm of the pre-Revolutionary period. He was a past master in the 18th century art of living well.

Fontenelle's three principal contributions to popular science are established values in the history of French literature, too well known to need gratuitous comment. The *History of Oracles* conveys the substance of a Latin

³ Si j'avais la main pleine de vérités, je me garderais bien de l'ouvrir.

⁴ That Fontenelle should have made so much money by the few books he published is proof positive that the purpose of the *Aufklärung* had been achieved: to spread general enlightenment by creating a receptive spirit for it.

⁵ Cited by Sainte Beuve, *op cit.*, 332.

dissertation in the simple, lucid manner he had made his own. In his *Plurality of Worlds*, an exposition of Cartesian astronomy transpires in the course of a flirtation with a marquise in an 18th century park. In this genre, as in his *Dialogues of the Dead*, he had mastered the literary form initiated by Plato, sophisticated by Lucian and modernized by Landor and Leigh Hunt. Like Lucian and Landor, Fontenelle makes his philosophic points by bringing celebrities of disparate type into imaginary conversations. The subjoined versions illustrate his gift of light-footed irony, his wide culture, his feeling for the tone of polite society—

"Glissons, mortels, n'appuyons pas."

Erasistratus twits Harvey because his great discovery does not help the sick. Raymond Lully convinces Artemisia that the twain of them are a pair of glorious hum-bugs. A very 18th Century sort of Molière ridicules the mysticism of Paracelsus. Erasmus maintains that the hereditary rank and possessions of Charles V were mere bits of luck, but Charles gets the better of it, in the end, by insisting that mental ability is innate and therefore equally dependent on blind chance. In these slight performances, there is already a trace of the acidulous quality of *Candide*, *Zadig*, *Micromégas*, of D'Alembert's conversation with Mlle. de l'Espinasse about the mysteries of generation, of the deification of cold reason, the heartless elegance, the refined scepticism and the other dissolving forces implicit in the Revolution.

I

ERASISTRATUS AND HARVEY

ERASISTRATUS:

Your teaching is arrvellous. What! The blood circulates in the body? The veins carry it from the extremities to the heart, and it leaves the heart to enter the arteries which carry it back to the extremities?

HARVEY:

I have done so many experiments to prove it that nobody can doubt it any further.

ERASISTRATUS:

Then we physicians of antiquity fooled ourselves finely when we thought

the blood has only a very sluggish flow from the heart toward the extremities of the body, and mankind is indebted to you for abolishing this ancient error!

HARVEY:

I claim as much; indeed, humanity is even further in my debt, since I set the pace for all these fine discoveries they are now making in anatomy. Once I had discovered the circulation of the blood, it remained for others to find a new conduit, a new canal, a new reservoir. It is just as if the body had been made over again. See what an advantage our modern medicine must have over yours! You wanted to heal the ailments of the human body without knowing anything about its workings.

ERASISTRATUS:

I admit that the moderns are better physicists than we were; they know more about the ways of nature, but they are not better physicians. We healed the sick just as well as they do. I'd like to have seen you moderns, you in particular, trying to cure Prince Antiochus of his quartan fever. You know how I went about it, how I found out from the way his pulse leaped up when he saw Stratonice, that he was in love with that fair queen, so that his illness came from the violent efforts he made to conceal his passion. Nevertheless I made a cure in that difficult and important case without knowing that the blood circulates. And I believe that, with all the aid this knowledge might have given you, you would have been flustered no end in my place. It was not a question of new conduits or new reservoirs; what was important in the case of this patient was the state of his heart.

HARVEY:

It is not always an affair of the heart, and not all patients are in love with their stepmothers, like Antiochus. I have no doubt that ignorance of the circulation of the blood has caused you to let many patients die on your hands.

ERASISTRATUS:

What! You really believe your new discoveries are so useful?

HARVEY:

Assuredly.

ERASISTRATUS:

Then answer, if you please a little question I am going to put. Why do we see every day as many dead souls arrive in these parts as ever?

HARVEY:

Oh! When they die, it is their fault, and no longer the fault of their doctors.

ERASISTRATUS:

But this circulation of the blood, these conduits, these canals, these reservoirs—all these things cure nothing then?

HARVEY:

We have not yet perhaps had leisure enough to put what we have learn-

ed in so short a time to any practical use; but it is inevitable that a rich harvest will be reaped from it all in time.

ERASISTRATUS:

My word for it, nothing will be changed. Look you, there is a certain amount of useful knowledge, which men soon acquire, to which they have added little and which they can hardly dispense with, even if they ignore it. They owe this debt to nature, that it has promptly inspired them with all they need to know; for had they trusted to their own slow perceptions to find it out, they would have been lost. As for the other things, that are not so essential, they will be discovered little by little and through long successions of years.

HARVEY:

It would be very strange indeed if a better knowledge of man's nature did not make us better doctors. For that matter, why amuse ourselves in perfecting our knowledge of the human body? It would be better worthwhile to drop it altogether.

ERASISTRATUS:

Then people would lose a fund of very agreeable knowledge; but as far as actual utility is concerned, I believe that to discover a new conduit in the body or a new star in the sky, are about of equal importance. Nature has willed it that at certain intervals of time, men should succeed one another through the fact of death. It is given them to defend themselves against it up to a certain point: but, beyond that, it is idle to make new discoveries in anatomy, it is useless to penetrate more and more into the secrets of the human body. Men cannot cheat nature; they will go on dying just as usual.

II

ARTEMISIA AND RAYMOND LULLY

ARTEMISIA:

That is entirely new to me. You say there is a secret for changing metals into gold and that this secret is called the philosopher's stone or *opus magnum*?

RAYMOND LULLY:

Yes, I once looked for it a long time.

ARTEMISIA:

Did you ever find it?

RAYMOND LULLY:

No, but everybody believed I did and still believe it. But as a matter of fact that secret was only a humbug.

ARTEMISIA:

Why, then, did you look for it?

RAYMOND LULLY:

I did not know better until I got down here.

ARTEMISIA:

It seems to me you had to wait a long time to undeceive yourself.

RAYMOND LULLY:

I see you want to chaff me. But we are more alike than you think.

ARTEMISIA:

I, like you? I, who was a model of wifely fidelity, who drank my husband's ashes and put up a superb monument to him, which was admired by the whole world: how could I resemble a man who has spent his whole life looking for the secret of changing metals into gold?

RAYMOND LULLY:

Quite so. I know whereof I speak. After all the fine things you have just been bragging about, you went crazy over a young man who didn't care a straw about you. For him you sacrificed the magnificent building that made you so famous, and the ashes of Mausolus you swallowed, were a feeble remedy against a new passion.

ARTEMISIA:

I never credited you with being so well versed in my affairs. That passage in my life was so well covered up that I never dreamed that many people knew about it.

RAYMOND LULLY:

You admit, then, that our destinies are alike, in that people have given us both credit for what we didn't deserve. You, they credited with having been always faithful to the shade of your husband and me with having got to the bottom of the Great Secret.

ARTEMISIA:

I grant it willingly. The public was made to be humbugged by lots of things. We must take advantage of things as they are.

RAYMOND LULLY:

But isn't there some other trait of resemblance between us two?

ARTEMISIA:

Up to this moment, I find it pleasant enough to be like you. Say on.

RAYMOND LULLY:

Have we not, both of us, looked for a thing we could not find: you for the secret of being faithful to your husband; I for that of changing metals into gold? I believe that wifely fidelity is like the *opus magnum*.

ARTEMISIA:

There are people who have such a low opinion of womankind, that they would regard the Great Secret as nothing in comparison.

RAYMOND LULLY:

Oh. I will guarantee that it is as difficult to get at as need be.

ARTEMISIA:

But how does it come that people look for it and that you, yourself, who seem to be a sensible man, should have chased this phantom?

RAYMOND LULLY:

It is true that no one can find the philosopher's stone, but it is advantageous to look for it. In seeking it, one uncovers, by the way, many fine secrets one was not looking for.

ARTEMISIA:

Is it not better to look for secrets that can be found than to brood over those we shall never find?

RAYMOND LULLY:

Every science has its chimæra, which people run after and never capture; but they acquire, by the way, much useful knowledge of other things. Grant that chemistry has its philosopher's stone, geometry its circle-squarers, astronomy its true meridians of longitude, mechanics its perpetual motion; it may not be possible to find all that, but it is very useful to look for it. I speak a language that you may perhaps not understand well, but you will understand, at least, that morality, too, has its chimæra: which is disinterestedness, perfect friendship. No one ever encounters it, but it is good to pretend that one does. In pretending, at least, one attains to many other virtues or to praiseworthy and estimable actions.

ARTEMISIA:

Once more, I am of opinion that we should let chimæras go hang and look only for what is real.

RAYMOND LULLY:

Can you believe that? In every way people have set up for themselves an ideal of perfection quite beyond their attainments. They would never set out on a journey if arriving at their destination was all there is to it; they must have before their eyes some imaginary goal which keeps them going. If any one had told me that chemistry would never teach me how to make gold, I should have dropped it. If any one had said to you that your parade of extreme fidelity to your husband was unnatural, you would never have troubled yourself to honor the memory of Mausolus with such a magnificent tomb. We should lose our courage if we were not bolstered up by false ideas.

ARTEMISIA:

It is not for nothing then that people deceive themselves?

RAYMOND LULLY:

How? Not for nothing! If Truth, by ill chance, were to reveal herself as she is, all would be lost; but she seems to realize how important it is to keep herself fairly well concealed.

III

PARACELSUS AND MOLIERE

MOLIERE:

If only on account of your name, I should be charmed with you, Paracelsus. One would take you for some Greek or Roman. It would never occur to any one that Paracelsus was a Swiss philosopher.

PARACELSUS:

I have made that name as famous as it is fair. My works are of great assistance to all who would penetrate the secrets of nature, particularly to those who have got to know about genii and elemental beings.

MOLIÈRE:

I can easily see that those are true sciences. To know the people one sees every day is nothing; but to know about genii one never sees, that is quite another matter.

PARACELSUS:

Undoubtedly. I have given very exact information as to their nature, their activities, inclinations, their different varieties and the powers they wield in the universe.

MOLIÈRE:

How happy you must feel to be so enlightened. For it is all the more probable that your knowledge of man himself must be perfect; yet many have never been able to get even that far.

PARACELSUS:

Oh! There is hardly any little philosopher who hasn't got that far.

MOLIÈRE:

I can well believe it. You are not then embarrassed by anything about the human soul, its functions, its union with the body?

PARACELSUS:

Frankly, there will always be certain difficulties about these matters, but, anyhow, we all know what philosophy has to teach about them.

MOLIÈRE:

And nothing more?

PARACELSUS:

No. Isn't that enough?

MOLIÈRE:

Enough! It is nothing at all; and so you jump from man, of whom you know nothing, to a knowledge of genii.

PARACELSUS:

Genii have about them something more likely to pique our natural curiosity.

MOLIÈRE:

Quite; only it is unpardonable to dream of them until we know all there is to know about human nature. It would seem as if the human mind had covered everything when it begins to set up illusory scientific problems to worry about, whenever it takes the notion. It is certain, however, that very real questions would keep it as busy as it might wish to be.

PARACELSUS:

The mind naturally neglects the simple sciences and runs after those that are mysterious. Upon them alone can it exert its full force.

MOLIÈRE:

So much the worse for the mind, then. What you tell me is entirely to its discredit. Truth presents itself, but because it is simple, the mind does not recognize it and prefers silly mysteries merely because they are mysterious. I am convinced that if most people saw the universe just as it is, and noticed that there are no virtues in numbers, no qualities attaching to planets, no fatalities bound up with periods of time or revolutions, they could not help saying about this admirable order of things: What! is that all?

PARACELSUS:

You ridicule mysteries into which you have not penetrated and which, in fact, are reserved only for great men.

MOLIÈRE:

I think more highly of those who do not understand such mysteries than of those who do; but Nature, alas! has not made every one incapable of understanding them.

PARACELSUS:

But you, who decide things with so much authority, what profession did you follow during your lifetime?

MOLIÈRE:

A profession very different from your own. You studied the virtues of *genii* and I the stupidities of mankind.

PARACELSUS:

A fine study, indeed; as if it were not self-evident that people are prone to stupidity.

MOLIÈRE:

It is a very general, confused sort of knowledge, but when one goes into details, one is surprised at the extent of the science.

PARACELSUS:

But, after all, what use did you make of it?

MOLIÈRE:

I brought together as many people as I could in a certain place and made it plain to them that they were all dolts.

PARACELSUS:

It must have taken a lot of talking to convince them of that fact.

MOLIÈRE:

Nothing easier. We make them realize their foolishness without any great flights of eloquence or carefully prepared arguments. What they do is so ridiculous that you have only to do the same thing before their eyes to make them split with laughter.

PARACELSUS:

I see; you are a comedian. For my part, I cannot conceive what pleasure people find in comedy. They go to laugh at manners on the stage. Why not laugh at the real things in actual life.

MOLIÈRE:

To laugh at things in the world, you have to be outside it and comedy puts you there. It presents a spectacle just as if you had no part in it yourself.

PARACELSUS:

But people go back at once to the life they were laughing at and take up their old places in it.

MOLIÈRE:

Absolutely. The other day, to amuse myself, I made a fable about the matter. A young goose was flying in the ungraceful manner of his kind when they fly and while flying just a foot above the ground, he insulted the rest of the barnyard. Unhappy animals, said he, I see you beneath me, nor can you cleave the air as I do. The mockery was brief. The goose flopped to the ground at that very moment.

PARACELSUS:

What good then are the observations made in comedies, if like your goose, people at once fall back into their commonplace stupidities?

MOLIÈRE:

There is a lot in making fun of oneself. There Nature has given us facility, to prevent us from being the dupes of ourselves. How often does it happen that one part of us does something with zeal and ardor while the rest of us makes fun of it? And if it were ever necessary, there would probably be a party of the third part, who would make fun of the other two. Does it not look as if man were made up of related pieces?

PARACELSUS:

I don't see that all that calls for unusual mental effort. A few light reflections, a few ill-founded pleasantries do not merit much esteem; but what severe mental effort is necessary to consider higher subjects!

MOLIÈRE:

You to your genii, I to my dolts; and yet, although I have only worked upon subjects open to all the world, I predict that my comedies will live longer than your sublime writings. Everything is subject to change of fashion, the products of mind as well as customs. I have seen I know not how many books and modes of writing buried with their authors, just as some people buried with their dead the things most precious to them in life. I am perfectly aware of the revolutions that may occur in the empire of letters, yet I guarantee that my plays will last. I know why. He who would picture things for all time should depict stupid people.

IV

CHARLES V AND ERASMUS

ERASMUS:

Make no mistake about it. If there were degrees of rank and station among the dead, do you think I would give you precedence?

CHARLES V:

What! a grammarian, a savant, and, to give your merits more than they deserve, a clever man pretends to be of more consequence than a prince who was once master of the better part of Europe?

ERASMUS:

Add even America, and it will not make you seem more fearsome. All this grandeur of yours was nothing more than a combination of lucky chances, so to speak; and if it could be split up into its components you would see it clearly. If your grandfather Ferdinand had been a man of his word, you would have had next to no hold on Italy; if other princes than he had had sense enough to believe in the antipodes, Christopher Columbus would never have applied to him and America would not be part of your kingdom; if, after the death of the last duke of Burgundy, Louis XI had known what he was about, the heiress of Burgundy would not have married Maximilian and the Low Countries would not have been yours; if Henry of Castille, brother of your grandmother Isabel, had not been a subject of scorn among women, or if his wife had not been of doubtful virtue, the daughter of Henry would have passed as his daughter, and the kingdom of Castille would have escaped you.

CHARLES V:

You make me tremble. I feel as if I were losing Castille or the Low Countries or America or Italy at this moment.

ERASMUS:

Don't joke about it. Neither a little good sense, on the one hand, nor a little good faith, on the other, could help you much. All you needed was the impotence of your great uncle and the coquetry of your great aunt. See, what a delicate edifice lies at the base of things turning upon luck.

CHARLES V:

Verily, it is impossible to stand an examination as severe as yours. I avow that you reduce my grandeur and my titles to nothingness.

ERASMUS:

Such however, were the things upon which you plumed yourself. It was easy to strip you of them. Do you remember about the Athenian Cimon, who having taken a number of Persians prisoners, exposed their clothing for sale, on the one hand, and themselves naked, on the other, which produced a bargain counter jam over the magnificent costumes with blank indifference as to their owners. I verily believe that what happened to those Persians would happen to many other people, if their personal merits were dissociated from the gifts of fortune.

CHARLES V:

But what is this personal merit?

ERASMUS:

Is it necessary to ask? It is whatever is within us. The scientific spirit, for example.

CHARLES V:

And it is reasonable to make that a title to fame?

ERASMUS:

Without doubt. Those are not gifts of fortune, like wealth or patents of nobility.

CHARLES V:

What you say surprises me. Do not sciences appertain to scientific men as riches to the wealthy? Are they not transmitted by way of succession? You learned men inherit from the ancients as the rest of us from our fathers. If they left us what they possessed, you inherited what you know; whence many scientific men regard what they have received from the ancients with the same respect that others regard their lands and their ancestral homes, in which it would vex them to have anything changed.

ERASMUS:

But the great were born inheritors of the grandeur of their fathers, while scientific men did not inherit the knowledge of the ancients. Science is not a matter of succession; it is something which each must acquire anew, or if it be a succession, it is difficult enough to acquire in an honorable manner.

CHARLES V:

Ah well! match the trouble it takes to acquire the things of the mind with the difficulty of retaining the gifts of fortune, and you will find them about equal; if it is only a question of difficulty, worldly affairs are often quite as troublesome as closet speculations.

ERASMUS:

But never mind science, let us stick to mind. That benefit is never a matter of luck.

CHARLES V:

You think so? What! Does not mind depend upon a certain conformation of the brain, and is there less luck in being born with a good brain than in being born the son of a king? You are a great genius; but ask all the philosophers why you were not born dull and stupid; it depended on nothing more than a minute disposition of fibres, upon a phase of finer anatomy which we shall never be able to perceive, and in the face of that fact, these witty gentlemen dare to maintain that they alone are independent of chance and so entitled to despise other men.

ERASMUS:

You think then, that to be rich or to have brains is equally meritorious.

CHARLES V:

It is luckier to have brains; but, at bottom, it is always a piece of luck.

ERASMUS:

Luck, then, is everything.

CHARLES V:

Yes, provided the term is applied to something we don't know. I leave you to judge whether I have not stripped men down more effectively than you. You only take away certain advantages of birth. I have wiped out mental capacity. If before being vain about anything, men could be certain of what really belonged to them, there would be hardly any vanity left in the world.

F. H. GARRISON.



POINT OF VIEW OF HUMAN RELATIONSHIPS*

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Social relationships of adults are expressions of human attitudes derived largely from experiences in early life. In other words, adult attitudes can be understood only if they are reduced to their earliest formation in the family circle. If we accept that statement, apparently the one point of agreement in all contending schools of psychology, then the most important study of man as a social individual is a study of the influences exerted upon him in the first years of life.

Since this study is basic to the study of psychoneuroses, my purpose is to present this phase of human experience—the significance in the life of the child of attitudes of the individuals who represent his first social experiences. I am especially interested in presenting this point of view because I think those physicians, especially pediatricists, who come in most frequent contact with the problems of infancy can perceive these relationships most clearly. The tacit agreement among workers with children that parental attitudes are naturally important in influencing conduct is stated as an obvious fact and let go at that. I hope merely to stimulate the appreciation of this fact as a significant and tangible basis for the understanding of the infantile neuroses. Examples follow:

1. An overprotective mother with a scientific method; method as symptom of an attitude: The case of a laboratory trained mother who utilized methods of Watson in bringing up her child. She had so conditioned her child in regard to bladder movement that it withheld urination for some hours when on a visit to a relative, at one year of age, being able to move its bladder only while sitting

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on a specific seat in the home, and when led to the seat by the mother and by no one else.

The problem which she presented had to do with technical methods of training the child. Actually, the practical methods she employed were, of themselves, of little importance. Of real importance were her motives in selecting the methods she employed. She used the scientific "canons" in order to have a platform enabling her complete isolation with the child. Standing by her "scientific principles," she prevented her relatives from having any contact with the child. She manipulated the technic of bladder training so that the child would respond to her alone. When, on recommendation, she enrolled her child in a nursery school, she hovered around the building for the entire morning, unable to leave the neighborhood of the school during the first week's session.

She showed all the evidence of maternal overprotection. Behind the overprotective attitude there was revealed an assertive, dominating tendency. The overprotection was reenforced by marital incompatibility. The problem presented is a striking illustration of the folly of attempting to treat a child by a set of rules, by a change in surface management when the method of maternal handling is the result largely of attitudes having their formation in early life.

2. The second example concerns a child who was referred because of temper tantrums. The mother presented the usual account of a child's negativistic behavior. The child violated the usual rules of going to bed on time, getting to meals on time, and the like. The negativistic performances were limited entirely to the mother-daughter relationship. The mother said that her numerous punishments, which were rather drastic, for example, putting the child to bed on a slight infraction of household rules, had no effect. In fact, the child would nullify the punishment by whistling on her way to the bedroom.

Limitation of the method of treatment to various rules of procedure with the child, to persuading the mother that

her punishments were too frequent or too severe, to encouraging a more affectionate relationship between the two, to the use of methods of praise for the child, and the like, had all been tried with no effect. The reason for the failure of all such methods lay in the maternal attitude. A prolonged study of the mother revealed clearly that she had strongly rejected this child. Her insight of her feeling of hostility to the child was revealed in a number of her own maneuvers; for example, she persuaded her husband, in making his will, to prevent her control in the way of the child's inheritance because, she confessed, in a quarrel with the child she was sure she would disinherit her.

A large number of situations out of which temper tantrums were precipitated were unconsciously instigated by the mother in order that she could with justice punish the child. In the early interviews she demonstrated her rejection of the child. She told how girls at adolescence become very attractive to the father, at a time in which the mothers, now middle-aged, are in the discard. The father gives his favors also to the girl and the mother, for all her sacrifices, gets nothing. Numerous details in the investigation of the maternal rejection are of similar form. We find that in the hostility to the daughter there was revealed a powerful hostility against all males. A frank expression of hostility against the female role in the sexual act was heralded in the early interviews.

This case illustrates anew the folly of therapeutic efforts that are not directed at the study of the relationship as such. Of course there are instances in which children must be treated as individual problems apart from the study of family relationships. The point I wish especially to stress is that in many, most likely in the majority of the difficulties presented by the child in early life, the symptoms presented are in large part responses within human relationships, in which a member of the family other than the patient may play the predominating role.

3. The third example is that of a child referred because of enuresis. The child's bladder control was estab-

lished at the age of two. A few years later a regression to the enuresis took place. The difficulty followed very shortly after birth of the second child. The mother stated that there was absolutely no evidence of jealousy, that the patient played very nicely with the younger brother, in fact, helped in mothering it.

In this case, I demonstrated to the mother the child's reaction to the baby by play technic in the mother's presence. An "amputation" doll was used to represent the younger brother. A game was devised in which the child, the mother and the examiner took part. The "amputation" doll, made of parts that can be removed and readjusted into sockets, was dramatized into a play with the younger brother. The child immediately took the doll apart, threw the head and limbs away, and apparently thoroughly enjoyed the demolition of the younger brother. Within a short period the mother brought further evidence of the patient's jealousy of the younger child, recalling numerous instances following the baby's birth. A number of other regressive symptoms resulted from the sibling rivalry.

This is a further example of a problem, primarily of human relationship, treated typically in a symptomatic manner. The mother had already used starred charts and similar methods for the cure of the enuresis without effect. The problem became one, not primarily for the cure of enuresis but of adaptation to the intrafamily constellation.

I hope I have made clear how the psychic formation within the individual that determines his social adaptation represents in large part his response to early parental attitudes. Your psychiatrist, when he deals with the adult, sees these psychic formations as more or less crystallized structures. They are seen in the grown-up child as stamped-in, typical patterns, at which time there may be little point in dealing with the parents whose work, as far as the social attitudes of the patient are concerned, represents a finished job. The worker with children, especially, sees attitude formations in their embryonic stages; hence, the

ability to affect parental attitudes at this stage is tantamount to affecting the destiny of the individual inasfar as this destiny, in terms of social relationships, represents the child's response to the attitudes of the parents in the early years of life.



PSYCHONEUROSES IN CHILDREN*

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If viewed from the pediatricist's standpoint purely, one might better term the subject of this evening's discussion "The effect on children of psychoneuroses occurring in parents, nurses or other adults with whom they come in contact and by whom their lives are controlled."

In a recent article on "Why Parents Consult the Pediatrician," we read "Pediatricists are being bombarded constantly with instances of failure due to peculiarities in the personality of the parent." The clinic from which the material for this article was obtained, records almost twice as many problems due to, or exaggerated by, the adult personalities involved as those of a purely medical pediatric nature. They further found that next in frequency to the diagnosis of disease of tonsils and adenoids came that of "parental mismanagement."

Doubtless children do suffer from neuroses of all sorts. At least, they present symptom complexes which are termed psychoneuroses, behaviour problems, tics, habit spasms, etc. It is natural that the pediatricist should meet with these functional derangements. Most natural because he is dealing with an age in which growth is an important factor, predisposing to functional disharmonies.

Such children resemble a sensitive film receiving impressions thrown upon it more or less strongly according to the intensity or duration of exposure. The results are, more often, reflections of the errors of the adult companion than intrinsic to the child's bodily or temperamental constitution.

Pediatricians have been aware of this threat as long as their specialty has existed. Even when the subject was

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considered to concern itself mainly with infant feeding and nutritional disorders, the method of administration of food was considered as important as the diet itself.

It has always been believed that the child's health depends more on how than where he lives.

Such opinions as I hold on this subject have been gained not thru a study of the psychiatric evidence in the case, but thru routine contact with sick children in institutions or in their homes. From the former, the institutional contacts, less is learned of the importance of the behaviouristic problem. This is naturally so because the behaviour problem is reserved for home use, for use with the familiars, is rarely tried on the stranger and, if so, usually meets with indifference and fails. The child does not bring much of this to the institution, nor is he often brought there for it. The average hospital historian places small emphasis on it.

In the last 5500 admissions to the Babies Hospital, there are only 55 instances in which behaviour problems and neuroses of some sort appear as of major importance—an incidence of 1 per cent.

Similar analysis of 1100 patients in private practice has furnished 96 instances, or 9 per cent.

It must be emphasized that these, and the following figures, do not represent the number of children who have neuroses incidental to some other major disease, but rather the number in which this type of difficulty represented the chief complaint because of which the visit was made. It is probable that an equal number were overlooked in both groups.

The results are not of statistical value but do offer some information as to the type of psychiatric problem that has a place in pediatric practice.

It has been said, and is in general true, that the problems of the early years are much the same whether the nursery looks thru sunshine down on Central Park or

thru grime up to the elevated structure. It is interesting, therefore, to compare the findings in the two conditions.

As to sex, there are more boys than girls. In the whole group, 60 per cent are boys—5 per cent more in the hospital than in private. If the world is made for men the same must apply to boys—more liberty, more attention. It was a man for whom the fatted calf died and today girl babies fill the ghats of India. Who ever heard of the seventh daughter of a seventh daughter!

Age seems to be equally of no importance. It was expected that more children would have been below five than over; more when child life is individual and parenthood less experienced. However, the chance for error in management is about the same at all ages. There was no difference in the age incidence between the hospital and private group.

With reference to state of nutrition, 69 per cent of the combined groups showed normal body weight and good tissue tone. Of the hospital cases 13 per cent less than private patients. Apparently, then, good nutrition is no safeguard against neuroses. The two conditions, structural and functional, are not related; and the normal ratio between the expected nutritional status of the two groups seems to be maintained.

In the consideration of these three conditions intrinsic to the child—sex, age and nutrition—none seem to play an important part in predisposition or causation of neuroses. On the contrary, there appeared 167 instances of bad parental management, occurring three times as frequently in private as in the hospital patients. This was the largest group. Forty-two examples of somato-neuroses, or obvious organic inferiorities: Twice as many occurring in private as in the clinic. This was the smallest group.

Sub-division of the former group gave neurotic parents in 50 instances, occurring four times in private to once in the hospital; overcontrol in 23 instances—7 times as frequent in private as in hospital; neglect in 26 cases—5

times as frequently in private as in the hospital. Shock, referring mostly to tics, accounted for 13 cases appearing with equal frequency in both groups.

The evidence again emphasizes the infrequency of neuroses arising from causes intrinsic to the child and the frequency with which the blame is to be laid on environment.

The somato-neuroses were twice as frequent in private as in hospital. This may be explained by the more immediate attention and treatment given organic disturbances in the well-to-do family.

Mistakes in control seem to be much more common in the private than in the hospital group; overcontrol was assigned the chief causative role 7 times in private to once in hospital; neglect 5 in private, to once in hospital. Both extremes seem natural when we consider the delegation and complication of control that goes on in the well-to-do nursery, under professional rather than maternal direction. In the clinic child, there is concentration of authority, simplicity of method and no time for catering to budding peculiarities.

Pediatrics, like any other branch of medicine, has its art as well as its science. It is in the recognition and management of these behaviour problems thru the parent that the art has found its greatest opportunity. Doubtless some such problems, altho important in diagnosis and treatment, receive too little attention by the pediatricist for, strive as he may to be psychiatrically minded, he must admit his tendency to relegate to second place some phases of his work that would be given first importance by the psychiatrist himself.

Pediatric literature contains a good deal concerning our responsibility in the realm of psychiatry. Some of it is funny, some tragic. One incurs prejudice against the pediatric author who states that correct diet insures normal digestion, thus protecting parent and child from problems of behaviourism. This man is not psychiatrically

minded, nor does he think deeply either psychiatrically or peditrically.

One becomes largely skeptical of the psychiatrist who claims that mother love, unless carefully censured and repressed, will and does destroy the child's later capacity to normal adjustment in business or domestic life.

We would avoid both extremes as well as any controversy as to which is the best museum piece—the psychiatrically minded peditrist, or the peditrically educable psychiatrist.

Brennerman would have it that the good peditrist must of necessity become a psychiatrist from within out, because of the very nature of his work. He admits, on the other hand, that the psychiatrist may, by sustained effort, become a good peditrist if he so desires. It is inevitable, therefore, with the peditrist; optional with the psychiatrist. He modified the implication somewhat by allowing that always there is need for peditrists and psychiatrists each better equipped with the other's special interest.

Weil, who has devoted more thought to behaviour problems in children than most peditrists, maintains that juvenile behaviour is a naturally important part of peditric practice because behaviour is the total reaction of the individual—the result of the impact of environment on inherited constitution. He believes that the attitude of the peditrist calls for broad inquiry rather than the application of psycho-analytical methods to any single behaviour problem. This is particularly true in the problems of childhood because behaviour is to be considered good or bad according to circumstances which apply before as well as at the time of observation—previous training, family habits, etc.

The problem is a complicated one. The patient is never a single unit, bodily or intellectually. The rest of the patient must always be considered—that rest being nurse, parent, grandparent, maiden aunt or elder brother. We can never consider or manage the child alone. It is not

always easy to make parent or nurse understand what we would do, or to enlist their sympathetic cooperation even when our intentions are seemingly understood.

This is, of course, trite. It applies, nevertheless, in support of the idea that such problems are found most often as reflections in the child of adult errors in administration.

Three things seem obvious as regards the relative responsibility of pediatricist and psychiatrist:

1. A pediatricist, to be safe in his relations with his patients, must be psychiatrically minded. Only if so, can he do his part in breaking into the vicious circle of behaviouristic problems on the part of the child—psychoneuroses on the part of the parent and so on around.
2. Children, even in infancy, do show evidences of definite neuroses. They may be transient and leave no scars if handled properly, or they may lay the foundation for permanent temperamental imbalance if neglected or over emphasized. Our figures relating to outcome indicate a definite tendency to recovery. The group in which cooperation could not be obtained did nearly as well as another where intelligent backing from the family was possible. Both incidence and the percentage of cures were greater in private than in the hospital—47 per cent in the former, 30 per cent in the latter.
3. These behaviour problems of the child will not occur if parents are properly educated as to childhood control. It is the old question of the precedence to be accorded the chicken or egg. Should education come direct from psychiatrist to parent, or indirectly from pediatricist thru the child? The pediatricist, being first on the ground, has the opportunity to foresee, forewarn and so perhaps prevent the need of psychiatric advice. If unable to avoid the necessity he can at least see that assistance is early sought. There can be no excuse for failure to appreciate the future possibilities. If we must admit the theory of regression to the unconscious mind of infancy, then the responsibility seems placed on the pediatricist.

The young patient is yet incomplete as to coordination of functions, inexperienced, without judgment or selectivity; reflex action has to substitute for that instinct with which other species are so well armed at birth. For this reason, knowledge comes less easily with experience. Because he is structurally incomplete he is functionally unstable. He is likely to run off the track because of the very rapidity of his development during his early years. He is incapable of understanding advice or utilizing experience. He is, therefore, particularly susceptible to unfortunate conditioning of those reflexes upon which he depends for the maintenance of his contact with the world.

It is, nevertheless, true that the infant, incomplete as he is, becomes early and delicately receptive to all sorts of stimuli from his environment.

He very early responds to disharmonies of temperament and requires protection from physical as well as constitutional injury. No physician can practice long among children without recognizing the difference in temperament seen so frequently in the infant of a happy and one of an unhappy family. This is something much too subtle to be explained by the mere strangeness accompanying a change in nurses. It is often the expression of the kind of welcome that awaited the baby's arrival, and the continued effect on him of the temperamental state of mother or nurse no matter how good the physical care.

The tired, harassed mother and irritable nurse are usually found with an unhappy, fretting baby. Institutional care produces one type of infant, motherly love another.

Taken chronologically, the conditions which the pediatricist is likely to meet are, first, those of early infancy. At this age, the behaviouristic problem is likely to relate to the ingestion and elimination of food. Rumination may appear; thumb, finger, lip or tongue sucking are very likely to manifest themselves. They illustrate what my psychiatric friend might call a conditioned response to a normal stimulus—an aberrant reflex due to a substi-

tution of artificial feeding for the normal stimulus of the lactating breast, or perhaps a confusion of the normal feeding reflexes thru unnecessary care of the mouth or the inexcusable exhibition of the pacifier.

In a state of nature, the normal baby would be fed from the breast irregularly but adequately—that is, when hungry and when opportunity arises. This is adequate and natural. Today, on the other hand, he must fit a schedule determining both quantity, quality of food and duration and intervals of meals.

Artificial feeding may be nutritionally adequate but still fall far short of satisfying the other requirement of the recipient and does naturally, therefore, explain many of these unfortunately conditioned reflexes occurring in the early months.

In the second phase, the child begins to possess capacity for coordinated motion and under normal conditions would be allowed freedom to explore such new possibilities as his increasing functional capacity has brought to him.

Under our present methods of life, this child must conform to constant restraint and so again continued reactions occur dependent less upon the child's physical or temperamental makeup, and more upon restraint which becomes unwelcome if unwisely applied. Here occurs the great opportunity for faulty management and behaviouristic difficulties are the natural result. Phobias follow upon unfortunate suggestion; hunger strikes, meal time nagging. Voluntary vomiting attracts the spot light. The thousand and one methods come into play by which children, at first subconsciously and later quite intentionally, arm themselves in the contest with olympic control.

Many types of behaviouristic disharmonies were encountered in the children studied. In the phobias, were included night terrors, fear of dark, of being left alone, sickness, apprehension, inadequacy and lack of capacity to mix. These characteristics appeared in about one half of

the cases, one in hospital to three in private. Food refusal including selective and slow eaters occurred also in one half the children and in about the same proportion in each group, 48 per cent. Vomiting, both habitual and voluntary, was the chief complaint in one-third the total and again in the same proportion in both classes, 24 per cent.

Under general obstructiveness was included disobedience, tantrums, spinal cord control or absence of purposeful conscious action, suspicion, refusal to sleep and petty jealousies. Practically all the children were of this type in connection with one or more other troubles.

Of bodily tics, facial or extremity spasms, sleep walking, bowel suppression and destructiveness, theft, lying, masturbation, holding of food in cheek and rumination, there were 30 per cent of the combined group, $21\frac{1}{2}$ in the hospital to 1 in private.

Of these five groups, three—food refusal, vomiting and general misbehaviour—appeared with equal frequency in both classes.

Of the remaining two, tics were $21\frac{1}{2}$ times as frequent in the hospital and phobias dominated to an equal extent in private.

There was more uniformity in the neuroses produced than in the causative factors.

Among these children no excuse was found for belief in Freud's theory of genitalization of the body nor was there evidence of regression to the unconscious infant mind for etiological factors of a sexual sort.

Inheritance alone or environment alone may be responsible for a number of high-strung, difficult children. Both play their part in causation but of them environment only is amenable to control and correction.

Neuropathic tendencies in the child are undoubtedly inherited and have their influence on his reaction to en-

vironment. It is, however, no proof that heritage is paramount because of the fact that of two children subjected to the same home influence, training and opportunity one may be neuropathic and one not. No two children even in the same family do meet exactly the same environment. There can be only one first, or only child, and few modern homes provide just the same atmosphere year after year. Nor is the same heritage passed down to each child.

The theory of biologic origin finds examples in the group studied. Many instances of the struggle to escape facts occur and altho organic inferiority may pave the way for a number of childhood neuroses, undue emphasis placed on the symptoms is more frequently directly responsible.

Except for the neuroses occurring in connection with establishment of maturity there is nothing to suggest the internal glandular system as an important factor.

Evidence of unbalance in the vegetative system is common to childhood and is naturally exaggerated in the presence of neuroses. It seems more to be an accompaniment than a cause.

The first figures directly bearing on environment were surprising. In the combined groups were found only 63 per cent of only, or first-born, children. A larger proportion than this would naturally be expected. More instances were found in the hospital group. These percentages tally with the thought that the first child gets more and inexperienced attention, but why the discrepancy in favor of the hospital group, 16 per cent greater than the private group?

Perhaps the answer lies in the fact that the former get maternal care only, the latter professional care by trained nurse and nursery maid. One is a trial baby purely, the other profits by the experience of those in charge. Emphasis seems to fall on environment in this case. So far the evidence is indicative more of inexperience and apprehension on the part of the parent than on any other particular quality inherent in the child.

Finally, as I am asked to speak for my own specialty, may I state what I think the attitude of the pediatricist should be toward these behaviour problems.

In general, he must not, in his anxiety to impress the parent, overdo the matter and so produce fear and discouragement rather than a confident and hopeful relation with the child.

Extremes of control fail with children. Overcare, over-anxiety will produce the same results as neglect. Rough handling and talk to, or in the presence of the child, will produce the same results as spoiling and too careful avoidance of controversy. Perhaps the most common cause for these behaviouristic failures in children is the inability of the parent to apply properly balanced scientific neglect where necessary, and the necessity is ever present.

Nothing so directly affects the child's environment as the suitability of methods used in his control and the wisdom of their application. Discipline may be so administered as to seem natural and be easy of compliance, or it may engender antagonism. To have reasonably uniform response, all discipline must be intermittent. If too constantly applied it loses force.

A great deal of energy can be conserved if the infant's right to do the unexpected occasionally is admitted. The action itself is less likely to be repeated if little or no attention is paid to it. Constant negation in the parent engenders obstinacy and unruliness in the child.

Noisy objection by word of mouth is not always understood, and usually results in frank rebellion or sullenness. A quiet act bears repetition, is therefore ultimately understood and is more impressive than many words.

The child who is forced to listen to frequent scoldings becomes increasingly difficult, either because of his own increased irritability, or his satisfaction in his ability to create a scene in which he is the leading actor. What is said to him passes in and out doing little more than amuse or distract him en route.

Ambition to excel and attract the attention of our peers is natural to all of us. Our methods are sometimes faulty, as in the case of the physician who insists on writing papers on subjects of which he knows less than his readers; or of the anti-social racketeer who replaces law and order by gang control—common objectives differing only in the environmental opportunity of the individual concerned.

We should recognize the same tendencies on the part of the child. He, too, will accept any method which seems likely to bring to him the prominence and attention which he normally desires. Thus are induced behaviouristic errors of all sorts because they promptly attract attention. It may be in his method of taking food. It may be in his refusal to comply with the usual requirements as to the elimination of body waste. It may be in general obstructiveness. It may be in phobias, pretended night terrors, or in wetting to gain the attention by night that he normally has by day.

If these bids for attention are responded to too quickly, then of course the habit is as quickly established and new methods devised for the maintenance of the attention aroused.

If, on the other hand, no audience is found, the joy of performance is removed. Scientific neglect, wisely applied, has its part in the management of every neurosis presented by the child.

I would include in the same category, as of equal importance, and approachable by much the same methods, all such ties or habit spasms as rumination, holding food in the mouth, selectivity in eating, food refusal, thumb sucking, muscle twitching, nail biting, rocking, breath holding and even masturbation.

They are all initiated by some local irritation or discomfort—pharyngeal obstruction, inflamed gums, hunger, indigestion, tight clothing, hang nails, or dermatoses of varying origin.

They are all aggravated by over-correction or restraint and soon pass from an intentional to a subconscious act. They are all amenable to simple explanation and do not need Freudian analysis for their clarification.

I would group in the same way all the temperamental disharmonies—negativisms, jealousies, sleeplessness, phobias, fretting, tantrums as initiated by fright or shock and continued by bad management.

I would decry routine or empirical operations on prepuce or labia, or such methods of control as must have induced a remark once made by a boy of seven to his playmates, one of whom had committed some infringement of the rules. He said "Now let's hit him and make him good."

Richardson has classified children into two general groups, the motor and the sensory type. According to which group the child belongs will depend the type of management best adapted to his needs.

For the motor or spinal type, or the sensory or hyper-sensitive sort, the same plea is made to home and school by the pediatricist for a reduction in the daily demands made upon the child during his growing years—for time before school to eat slowly, and unhurriedly to prepare for the day; for time at noon to complete digestion before activities begin; for provision for that most important hour of the day, the one in which nothing is done; for minimizing extra appointments such as music, dancing, drill and homework, in order that the schedule may not be full from morning until night.

The unacademic explanation for the neuroses of New York children may well be summed up as over-stimulation—by noise, competition, parental anxiety, apprehension or ambition, by standardization of school and exercise, by complicated amusements—in short by the lack of that thing most necessary to unmyelinated youth—quiet.

CERTAIN PEDIATRIC DOUBTS ABOUT MODERN PSYCHIATRY*

BRONSON CROTHERS

Boston

Pediatricians in general have had no training in formal psychiatry and pay relatively little attention to those who urge them to acquire a knowledge of this complicated subject. Clearly this ignoring of psychiatry is unfortunate. Psychiatry instead of being one of the accepted and essential parts of medical knowledge has been more or less isolated. The reports of most of the organized clinics for child guidance, or the like, include a table showing the referring individual or organization. As a rule only a few in each hundred are referred from doctors or hospitals. Apparently the aims and the results of the specialized clinic are better understood by teachers, social workers and parents than by doctors in general. In occasional cases a psychiatric unit in a general medical centre receives most of its cases through medical channels but certainly such a situation is exceptional.

It seems clear to me that one of the most urgent problems facing the pediatrician today is that of intelligent team play. The child guidance movement, chaotic as it is, ought to be studied by pediatricians. Unless doctors in general cooperate they will find that parents and teachers are looking to them in case of physical disorders and to another group for advice on "emotional" disturbances. This arrangement will throw upon parents and teachers the most difficult diagnostic points in all medicine for they will have to decide whether any given group of symptoms is the result of structural disease or of functional disturbance.

*Delivered before The New York Academy of Medicine, April 7, 1932.

Two major changes of point of view seem to me necessary. First, the medical profession, in general ought to realize that psychiatrists, as they now practice are interested in people, especially children, neither feeble minded nor insane, who are making less of life than they should. Furthermore the rest of us ought to help the psychiatrist to keep upon good terms with us. Quite clearly it is a serious matter, for us, that psychiatrists in general do not associate with pediatricians. An attitude of sustained interest in psychiatry might attract attention.

The other side of the question concerns the attitude of psychiatrists. If they seriously want doctors at large to work with them they must, I believe, do various rather difficult things. In the first place they must be prepared to control propaganda or else disown it. As things are now it is impossible to find out exactly what psychiatrists, as a group, want to do.

Then I believe that there must be a body of fact and opinion in any medical division which is peculiarly adapted to men with medical training. As far as I can see this particular field is not defined by psychiatrists. Doctors, social workers, parents and teachers are given pretty much the same dilutions of psychiatric information. Certainly various non-medical people are carrying on enterprises almost identical with child guidance clinics, as far as the non-psychiatric observer can tell.

If psychiatrists can present a clear program, generally accepted by a majority of their group, can show doctors in general how they can fit in and can supply them with an introduction that is definite, I believe that cooperation can be obtained.

If the subject is not crystallized sufficiently for definite formulas to be given, I believe that doctors in general ought to find ways to utilize the assets disclosed by psychiatrists, psychologists and teachers. The search among obvious treasures will lead different men to different goals, but out of it all may come contributions of value.

The only thoroughly pernicious attitude is one of contemptuous indifference to the whole subject. I can easily imagine that the next advances in the child guidance field may come from pediatricians, but they will not come without effort and probably they will not come from men who ignore the work of psychiatrists and psychologists.



THE SIGNIFICANCE AND VALUE OF THE LANGE GOLDSOL REACTION IN DISSEMINATED SCLEROSIS*

HELEN J. ROGERS
New York

(ABSTRACT)

Recent reports from London of a possible etiological factor for multiple sclerosis having been found, and a tentative therapy based thereon suggested the following study to ascertain the present status of the laboratory findings in relation to clinical course.

Seventy clinically proven multiple sclerosis cases were studied over a period of nine months under Dr. Wilson's supervision. These were routine admissions to Dr. Kinnier Wilson's clinic.

Previous workers from 1912 to 1930 had been unanimous in their conclusions and were confirmed by sufficient autopsy material to admit of no doubt of their conclusions.

In 1930, however, a group of workers under Sir James Purves-Stewart, reporting on a new method of therapy, suggest that its success is indicated by disappearance of the spinal fluid changes. They claim that all their cases show initial alterations in the fluid, and that these disappear or tend to disappear following specific therapy.

Our conclusions are as follows:

- I. Of 70 cases we find 25 per cent show completely normal Lange colloidal goldsol curves; 25 per cent show paretic curves, and 50 per cent show almost every possible intermediary curve between the normal and paretic zones.

*From the clinic of Dr. S. A. Kinnier Wilson, National Hospital, Queens Square, London. This thesis was written in accordance with the requirements of the recipient of the Alexander Cochran Bowen Scholarship. The Scholarship was awarded Dr. Rogers in 1930.

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- II. We find no definite parallel between the clinical course and the spinal fluid findings. Often a normal curve occurs in an acute case as well as a strong curve in an old stationary case, and vice versa.
- III. We find that the fluid alters both spontaneously and following treatment of all kinds—with or without a corresponding clinical modification.
- IV. Our results confirm the conclusions of all those from 1912 to 1930 who have worked with a large number of cases.

With the exception of the recent reports of 1930 the consensus of opinion seems to be that the Lange goldsol test, while of distinct interest, is not sufficiently definite to be used as an indication of the success of therapy.

In a disease that has spontaneous remissions we must be very guarded as to the value of any therapy, and if we wish to use the goldsol test to help in gauging the results of treatment we must first establish what the normal curve is in any case of disseminated sclerosis.

Up to the present we feel that no one has shown that any real value can be placed on colloidal gold curves in disseminated cases.

We have noted that 25 per cent of all cases in any stage of the disease show perfectly normal gold curves. We have also noted that the curve is liable to change with or without treatment, and we have the results of autopsied cases to verify these statements.

If the Lange curve is ever to be used in disseminated sclerosis as a basis or guide for therapy we feel that sufficient research should first be conducted to find out what constitutes the exact normal for a case of disseminated sclerosis. We would suggest that each case must be studied over a period of years through the various stages of remission and exacerbation; that the patient should be submitted to lumbar punctures at regular intervals in the acute

and chronic stages; that one series of cases should remain untreated, and a second series be treated with the usual arsenical preparations and a third with a more specific therapy if there be one. Then we will have a sufficiently large series of cases properly controlled and studied through the periods of remission and exacerbation to judge if the Lange test is to prove of value in the study of the disease. The largest series of cases ever studied in the twenty years since this test has been used is Muller's (100 cases), and when we compare this with the thousands of cases of syphilis published with coincident Lange curves, we realize that the value of the test in disseminated sclerosis still remains to be proved.



REPORT ON HOUSING

COMMITTEE ON PUBLIC HEALTH RELATIONS

There exists in this country a continuous tendency toward housing congestion, with all of its attendant dangers. In 1921 only 24.4 per cent of the people living in 257 American cities were housed in apartment houses; in 1928, homes for 388,678 families were provided in new buildings in these cities, and 53.7 per cent of these were in apartment houses.

The problem of the housing of the masses presents hygienic as well as economic aspects. In 1929, the municipality of Paris, in deference to the same principle, added hygienists to its City Planning Commission, which had previously been composed of architects and lay officials. At the President's Conference on Home Building, held in Washington in 1931, Professor Rosenau made a report on Housing and Health, to which were appended notes on the "Relation of Housing and Health" by Dr. Haven Emerson.

The Committee's cooperation has been requested by various civic organizations interested in the establishment and maintenance of housing standards consistent with health. Conferences have been held with spokesmen for the State Housing Board, the Regional Plan Committee, the Housing Committee of the United Neighborhood Houses, and the Housing Association of New York, at which the defense of sound regulations already in existence as well as future legislative proposals were discussed from the medical standpoint.

Such important bodies as the Medical Research Council of England, the United States Children's Bureau, and the Committee on Regional Plan of New York and its Environs have occupied themselves with the investigation of the housing and health problem from various angles. The literature on the subject is extensive. The Director of the National Housing Association supplied a comprehensive list of references of interest and value.

The Regional Plan Committee of New York sought to lay secure foundations for its housing recommendations by the citation of medical authority in proof that the absence of sunlight was an important factor in the causation of rickets, that sunshine is the most active known stimulant for the enhancement of bodily resistance to tuberculosis, that sunlight is an effective general bactericidal agent, and that even daylight acts in the same way though at a much slower rate; and that if sunlight is permitted to approach and to warm one or two sides of a building it favors desirable ventilation by inducing a gentle circulation of air by reason of the difference in local temperature which it creates.

Dr. Emerson calls attention in his report to the common failure of writers upon housing and health to recognize the limitations of the statistical method when applied to the questions at issue, and to errors of argument and reasoning which are due to the lack of control of conditions necessary for a basis of comparisons; "only when the race, age, sex, occupational, economic, and intelligence or adaptability level of population groups are taken into consideration, can valid conclusions be drawn from the almost universal experience that where housing is of a poor quality in a constructional, spatial or sanitary sense, high death rates, high disease incidence, and poor child development, prevail."

Reports purport to show that the health averages of entire neighborhood populations have been lifted through housing projects in London which began with the abolition of unwholesome slums and ended with the replacement of the inhabitants of the slums on the land which they had previously occupied, in sanitary tenement blocks erected by the local government authority. In these cases morbidly reports for definite population groups cover periods before and after housing treatment.

An attempt by the Medical Research Council of England to correlate social conditions (including poverty and the

domiciliary conditions with which poverty is associated) with acute rheumatism was inconclusive with respect to the significance, in this particular disease, of basement and ground floor locations, congestion, ventilation or lighting. From a study of housing conditions in relation to the incidence and fatality of measles, however, the interesting conclusion was reached that while among crowded tenement quarters, housing a working class population, measles is essentially a disease of children under school age, in working class and middle class families who live in houses of the single entry type the disease is predominantly one of children of ages five to ten and that in country districts also the disease tends to be one of school children of ages five to ten. In the language of the report, "certain types of tenement buildings may contribute to a high death rate for measles by exposing to infection a larger number of people at the earlier years than is the case in an area where the cottage type of house predominates."

"In the categories of communicable and infectious disease, and nutrition or growth and development, there is much circumstantial evidence and some quite suggestive correlation of a statistical nature to the effect that there are limits of crowding in room, house, lot, and block beyond which people of low economic levels, of mediocre intelligence, cannot be permitted to occupy houses or apartments."—(Haven Emerson).

A study by the Scottish Board of Health of maternal mortality in Aberdeen, over a period of ten years, failed to reveal any definite relationship between environmental conditions and puerperal mortality; in this study cleanliness of house, size of house, crowdedness of individual houses and congested areas were separately considered and no significant association of any of them with puerperal mortality was ascertained. On the other hand Dr. Emerson quotes studies by the Children's Bureau, by Newsholme in England, and by Walker in Detroit as consistently showing "a close correlation between loss of life from childbirth and in the first year of infant life and the

number of persons per room in tenement housing and particularly with the number sleeping in the same room with the infant . . . it is the use more than the construction arrangement and equipment of buildings that determines their harmful influence on life. Regardless of race stock, the more persons there are per room, and the more families there are per dwelling, i.e., the greater the block, lot, and room crowding the higher the infant mortality rate."

The director of the nursing bureau of the New York City Department of Health in a discussion of the effects of present economic conditions recently said that "there seems to have been little or no increase in illness as a result of economic conditions. However, every nurse who visits homes affected returns with a report of extreme nervousness and worry on the part of all members of families so affected.—One of the greatest causes of this nervousness, we find, has been the crowding of large families together under one roof."

The Committee is not at present in a position to undertake the original investigation of problems relating to housing, which include questions in biology, physiology, neurology and mental hygiene, as well as several phases of social economics. The Committee, however, believes that it is incumbent on the medical profession to take an active part in shaping protective housing legislation. In order to perform this duty in an intelligent and effectual manner the profession must familiarize itself with a great body of recorded observation and keep in touch with current experimentation on the following subjects:

A. The relation of light to health

1. animal experimentation
2. human experience
 - a. domestic
 - b. clinical

B. The relation of air space and ventilation to health

1. lowered resistance to disease (loss of immunity)

- C. The influence of types of housing and of house and room crowding on the spread of communicable disease
 - 1. theoretical considerations
 - 2. field findings in various diseases, individually considered
- D. The influence of crowded housing on nervous and mental health
 - 1. noise and repose
- E. The essential sanitary equipment of dwelling places
 - 1. water supply
 - 2. sewage
 - 3. disposal of wastes
 - 4. preservation of food
 - 5. cleanliness
- F. Economic conditions that affect housing standards in a manner prejudicial to health
 - 1. wage standards and periodic unemployment
 - 2. rents as affected by
 - a. methods of construction
 - b. methods of financing
- G. Progress in housing reform
 - 1. building laws affecting safety
 - 2. zoning laws
 - 3. sanitary regulations
 - 4. slum clearance projects
 - 5. model housing projects (city, suburban, and rural types)
 - a. producing normal return on capital (business basis)
 - b. producing *less than* normal return (philanthropic)
 - 6. state aid and participation
 - a. tax exemption
 - b. municipal construction

The range of these studies is such that if means were available the Committee could easily utilize to advantage the services of an additional staff; lacking such assistance the activities of the Committee, if continued, must necessarily be limited, but the Committee hopes nevertheless to be able to collaborate helpfully with responsible civic organizations which, while relatively inactive at the moment, are likely to renew their activities on an increasing scale when general business conditions improve; such

organizations, according to their own testimony, will always be in need of medical guidance and support. There is no doubt, however, that the present tenement house law of New York State should be amended in at least two particulars:

1. to eliminate the community toilets in tenements and provide a separate toilet for each family. The present provision permits conditions which are not in the best interest of public health.

2. to eliminate the existence of "railroad" tenements by which rooms are permitted as living quarters whose sole connections are with rooms having an outside window. This leads to overcrowding, darkness and breathing of vitiated air.

The establishment of a Housing Section by the American Public Health Association would no doubt intensify the interest of public health officials in the housing problem, and the creation of such a section has been suggested to the President of that organization.

Approved for publication by the Council of the Academy of Medicine on January 27, 1932.



REPORT OF MUSEUM COMMITTEE

At a meeting of the Council of the Academy held on February 24, 1932, the recommendation of the Committee on Museum that the Academy establish a medical museum, was approved. This is a very important and far-reaching step and will require considerable thought and planning on the part of the Museum Committee. There are a number of questions which should be given consideration in regard to the plan and scope of the proposed museum, its educational usefulness, and how it may be established and developed.

A medical museum, in the broadest sense, might be one of four types, or it might combine any two or more of these types: Anthropology, Public Health and Hygiene, History of Medicine and Modern Medicine.

ANTHROPOLOGY

The American Museum of Natural History includes in its collections a certain number of exhibits of different races of mankind, showing their characteristics, habits and environment. It also has maintained exhibits of bacteria. It is concerned essentially with the exhibition of different races of mankind and the development of the human species, whereas the proposed museum should deal with man's environment and its influence upon his life. In the modern sense the complete story of man's environment would naturally include certain aspects of housing, industry, agriculture, habits of living, diet, hygiene, and public health.

HYGIENE AND PUBLIC HEALTH

The development of a Museum of Hygiene and Public Health should include an exhibition which will emphasize all facts and procedures utilized in the maintenance of the public health. This would include water supply and purification, milk supply, pasteurization and delivery, sewage disposal, the various measures undertaken to prevent communicable diseases, hospitalization, sanatoria, personal hygiene, habits of living, foods and diets, health appliances, and so on.

HISTORY OF MEDICINE

A museum exhibiting the story of the history of medicine would be primarily of interest to physicians, of less interest to the laity, and would at first have but little direct value for them. It could serve to emphasize the advances in medical knowledge upon which the exhibits in other departments of the museum are based. Even though of greater interest to physicians the historical exhibits could be made useful to the public by interrelating them in this manner with the material in other departments.

MODERN MEDICINE

A museum of modern medicine would include the whole range of medical activity, anatomy, physiology, surgery, pathology and all the other special fields of medicine, and be designed primarily for the education of the public. Like the Museum of Natural History its ability to serve the public is not incompatible with the maintenance of a scientific collection of great value to medicine. It should also be utilized for the education of medical students and physicians and should be a live organization with an intelligent, well-trained staff.

FUNCTIONS COMMON TO ALL MUSEUMS

The successful museum should not only be interesting but of important educational value for the public, and have an influence on the lives of the people who make use of it. A museum would require lecture halls, machinery for publicity and propaganda, work rooms, display halls and a well-trained educational and technical staff.

THE PART PLAYED BY THE ACADEMY

It would seem obvious that the question of creating a museum of anthropology must be relegated to the distant future after other departments have been established. A museum of hygiene and public health would require ultimately a large tract of ground, fully as large as a city block and its ultimate cost would run up to many millions.

It is therefore impractical for the Academy to contemplate such a venture at the present time in spite of its undeniable value to the public.

With the limitations of space that will be available in the new addition and also the improbability of being able to secure funds for operation, it would seem wise for the Academy to limit itself at the present time to the utilization of its present material on the history of medicine in New York and to develop plans for the organization of a modern Medical Museum as opportunity offers. The development of such a Medical Museum will require ultimately more land and more money than is now required for the maintenance of the Academy. If and when that time arrives, the question may be raised as to whether such a Medical Museum should be maintained by the Academy, or whether like the Museums of Natural History and of Art and the Botanical and Zoological Gardens, it should be maintained by an independent organization and administered by its own Board of Trustees. Some steps should be taken at the present time so that the establishment of a Medical Museum in New York need not be postponed indefinitely. It seems entirely proper for the Academy to make a beginning in the modest manner which has been proposed, meanwhile maintaining an open mind as to where future development may lead.



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DEATHS OF FELLOWS OF THE ACADEMY

SAMUEL WYLLIS BANDLER, M.D., 39 West 85 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1894; elected a Fellow of the Academy November 7, 1901; died, July 31, 1932. Dr. Bandler was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the American Obstetrical Society, a member of the Association of Obstetrics, Gynecology and Abdominal Surgery, and Consulting Gynecologist to the Post-Graduate Hospital.

GRAHAM LUSK, Ph.D., 1030 Fifth Avenue, New York City; graduated from Columbia School of Science, University of Munich, and Yale University in chemistry; elected an Associate Fellow of the Academy May 19, 1904; died, July 18, 1932. Dr. Lusk became a member of the faculty of Cornell Medical School in 1891 and was professor of Physiology from 1909 to the time of his death. He was Scientific Director of the Russell Sage Institute of Pathology. He was a member of many National and International societies and received honorary degrees from Columbia, Yale, Munich, Glasgow and Edinburgh.

JOSEPH FREDERICK TERRIBERRY, M.D., 120 West 73 Street, New York City; graduated in medicine from Bellevue Hospital Medical College, New York City, in 1880; elected a Fellow of the Academy April 1, 1897; died July 28, 1932. Dr. Terriberry was a member of the Neurological Society, and a member of the Alumni Association of City Hospital.

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EDITORIAL

THE LITERARY TRADITION IN ENGLISH MEDICINE

(WITH SIDELIGHTS ON MEDICINE IN ENGLISH LITERATURE)

Over the mantel in Sir William Osler's library at No. 1 West Franklin Street (Baltimore) there stood a panel of portraits of Linacre, Harvey and Sydenham, the three founders of English medicine, bearing the legend *Litterae: Scientia: Praxis*. This device, an invention of Sir Henry Acland's, sums up the history of English medicine before the time of John Hunter and Jenner, when physicians ceased to lecture or write in Latin and began to express themselves in the vernacular. English medicine differs from French and German medicine in that it starts at the bedside, where French medicine circles around the hospital and German medicine around the university clinic and the laboratory, as a scientific discipline in the academic curriculum. Implicit in the very core and fibre of English medicine is a great literary tradition, not that the medical literature of Great Britain has any special place in the history of English literature, but in the sense of the observation of Helmholtz that the object of English university teaching seemed to be to produce gentlemen, who excelled in athletic sports and wrote their language well. Linacre, whom Fuller called "the restorer of learning in England," was the essential founder of this tradition. Harvey, through his demonstration of the circulation of the blood,

Read before the Tudor and Stuart Club, Johns Hopkins University, Baltimore, Md. on April 12, 1932.

altered the whole fabric of existing medicine and headed a long line of isolated investigators, who made the functions and disorders of the circulation almost an English theme; and Sydenham was the first of the great line of English bedside practitioners, culminating in Osler himself. These three generic types of medical men, the literary physician, who writes, the laboratory physician, who investigates, and the bedside doctor, whose whole duty is to get sick people well, are essentially different in capacity and temperament, although one type may sometimes lap over into another. Linacre, the first exemplar of the man of letters in English medicine, was primarily a grammarian, who studied medicine in Italy, where he met Politian, Hermolaus Barbarus, Aldus, Leonicens and other Renaissance scholars. This gave him his incentive to study and to translate certain Greek medical texts which had come to the front with the Revival of Learning. Graduating at Padua, Linacre took another medical degree at Oxford; taught Greek to no less than Erasmus and Sir Thomas Moore; was the private tutor of Prince Arthur and the Princess Mary; became one of the King's physicians at £50 a year; practised in London, numbering Cardinal Woolsey among his patients; founded the Royal College of Physicians (1518), of which he was the first president; and through his endowment of a number of lecture foundations at Oxford and Cambridge, was the originator and organizer of medical teaching at these Universities. Linacre was thus, in a very real sense, the founder and prime mover of English medicine. His literary productions include two Latin grammars, written in English for the use of the Princess Mary; a book on Latin syntax; and Latin translations of Galen's treatises on personal hygiene (1517), therapeutics (1519), temperaments (1521), natural faculties (1523), the pulse (1523) and the differentiation of symptoms of disease or semeiology (1524). The Latin grammars were less popular in England than on the continent, where they were translated and passed through many editions. The versions of Galen ly clarified the textual meaning of the great Greek n, but placed Linacre in the front rank of the med-

ical humanists of the Renaissance, who, in the words of Osler, "restored to the profession the Greek ideals and again made observation and experiment the Alpha and Omega of the science." The influence of Linacre upon the manner and mode of literary expression in English medicine was decisive, but very much as the fine diction of *Paradise Lost* bears the impress of Milton's experiments in Latin and Italian verse or as Swinburne acquired his remarkable command of English through a similar proficiency in other tongues. Up to the middle of the 18th century, the learned of the profession continued to write and lecture in Latin. But in the considerable line of classical British medical texts between Harvey and Cullen there is enough elegant Latinity to justify the eponium of Erasmus: "What can be more acute, more profound, more refined than the judgment of Linacre?" With Linacre indeed, English medicine became a going concern. He died of stone in the bladder on October 20, 1524 at the age of 64, having just completed his book on Latin syntax, which was published two months after his death. Erasmus refers to him, in his *Eulogy of Folly*, as one who spent the last years of his life in drudging to conquer the details of grammar and "made it the chief part of his prayers that his life might be so long spared till he had learned rightly to distinguish between the eight parts of speech, which no grammarian, whether Greek or Latin, had yet accurately done." Upon this hint, two English medical scholars, Payne and Osler, assume that Linacre was the original of Browning's poem, "The Grammarian's Funeral."

Linacre and Browning! These names suggest another phase of our subject upon which one may touch but lightly, namely the remarkable way in which the medical thought of different periods has interwoven itself into the fabric of English literature and the number of English physicians or medical graduates who have become poets and men of letters.

Before Linacre's time, there are but few medical allusions in the English literature of the Saxon and Anglo-

Norman periods. The Anglo-Saxon epics, such as *Beowulf* or the *Fight at Finnsbury*, and the legends of the Arthurian Cycle, abound, like the Homeric poems, in one particular only: war-wounds. At the same time, the innumerable English medical and scientific manuscripts of the Middle Ages are mainly things of shreds and patches and overlaid material, derived from late Roman and Byzantine medical tradition. During the long subsidence of Anglo-Saxon literature from the Norman conquest to Chaucer, English physicians, such as Ricardus Englicus (Richard of Wendover), Gilbertus Anglicus or John of Gaddesden wrote medical treatises not particularly remarkable for either matter or manner. Roger Bacon founded the study of science in England and at least one Anglo-Saxon surgeon, John of Arderne, made a mark above the average by his account of an original operation for fistula in ano, written in the idiomatic, almost Anglo-Saxon, speech of the period. In Chaucer, the physician or Doctor of P. Gréc appears for the first time as an individualized char; was of whom we learn that "he was grounded in pæss Mary;" "a verrey parfaict practisour," who knew all "par; practise writings, in his day, but "whose studie was but litmong his Bible of last line, "Therefore he lovede gold is (1518). -nt and the proverbial avarice of the mediæval his or wish b

The Fifteenth Century, so sterile in literary productivity that its one great book, *The Morte d'Arthur* of Sir Thomas Mallory, has been likened to an oasis in the desert, was yet remarkable for a number of popular, semi-medical MS. treatises in the vernacular, such as the *Lctary of Andrew Boorde*, the *Babees Book*, the English version of Lanfranc, all published by the Old English Text Society, and for the appearance of English medical incunabula, the earliest of which was the *Governayle of Helthe*, printed by William Caxton in 1491. These vernacular productions have the choppy, staccato manner of Bishop Latimer's sermons and suchlike English prose. In the 16th century,

²So, too, the apothecary appears as a leading figure in John Heywood's dramatic satire on quackery, *The Four P's* (1545-7).

Linacre, as we have seen, sets English medicine in motion, and through his grammatical writings and translations, establishes a norm of clear and precise modes of expression in writing on medicine, both in Latin and English. Linacre ushers in the crowded Renaissance, the period of the foundation of modern anatomy by Leonardo and Vesalius, of the great medical printers, humanists, lexicographers and botanists, of Paracelsus and Paré and Fracastorius. Yet curiously enough, the outstanding English medical books of the 16th century are in the vernacular, and never has the medical thought of any period been so extensively reflected anywhere in secular literature as in Shakespeare and his fellow dramatists of the Elizabethan age. The treatise on sweating sickness by Dr. Caius, of the *Merry Wives of Windsor*, exists not only in Latin, but also in an old English version, which, like the first English book on anatomy, that of Thomas Vicary (1548), is in the tense nervous Saxon of Bishop Latimer's sermons. The names for the parts of the body are as droll as those employed by Walt Whitman in *Children of Adam*. Profane references to parts of God's body, such as 's blood, or 's nails, also came into vogue in this period, among soldiers and sailors. The first English book on obstetrics, the *Byrthe of Man-kynde* by William Raynalde (1545) was also vernacular, a translation of the *Rosegarten* of Eucharius Röslin (1513). In this group belong the *Judycyal of Urines*, printed by Wynkyn de Worde (1516); the *Grete Herball* of Peter Treverus (1516); Thomas Phayre's *Regiment of Life* (1545), a version of the Salernitan *Regimen Sanitatis*, which contains his *Boke of Children* (the first English treatise on pediatrics); Thomas Gale on gunshot wounds (1563); Walter Bailey's little book on diseases of the eye (1586); the surgical treatises of William Clowes (159) and Peter Lowe (1597); the first booklet on tropical diseases, ascribed to George Wateson (1598); and many stately folios, conveying Tudor translations of Ambroise Paré, Brunschwig, Arceo, Oviedo, Monardes, Acosta, and other European contributors to medicine and surgery. The literary manner of these writings is the high pitched, ex-

pansive, confident, self-assertive, somewhat garrulous manner of Paracelsus, Brantôme and other prose writers of the Renaissance. Perhaps the most vigorous exponent of this literary swashbuckling is the military surgeon, William Clowes, whose treatise on gunshot wounds abounds in lively pen-pictures of his time, and who reveals himself as a master of billingsgate in berating the interlopers and incompetents of his craft. The prose of the Elizabethan physicians is of the type described by Matthew Arnold as Corinthian, the prose of one "whose reason has not cleared itself," too profuse and redundant, too lacking in syntax, too much overloaded with ornate epithets, saving clauses and superfluous rumble-bumble to attain to the balance and sense of proportion associated with the quality of literary style. One production of the period, midway between medicine and literature proper, is highly characteristic. *The Metamorphosis of Ajax* (1596) of Sir John Harington, coming, as it does, at the end of the 16th century, has the pleasant, chatty, communicative manner of the prose interludes of the Jacobean plays. Harington's versified paraphrase of the Salernitan *Regimen* (1607) recently edited by Dr. Francis R. Packard (1920), is, like Harington's own epigrams, witty and piquant. But even the prose of the major productions of Lord Bacon is sometimes bewildering and consequently stupefying in its twisted syntax, far inferior, indeed, to his Essays in literary merit and medical interest. Bacon, as Singer pointed out, is the solitary instance of an attempted fusion between the law and science, and, as might have been expected, it proved to be a sad case of trying to "solder incompatibles and make them kiss." In relation to his fundamental aspiration, the advancement of science, Bacon is, in his own words, more memorable in that "he rang the bell which called his wits together," than for anything he wrote or accomplished. Some of his ideas on medicine, such as, the prospective development of comparative anatomy and pathology, the advantages of physical exercise over régime, the value of psychotherapy in mental disorders, the notion of administering remedies in a certain order, are good.

His experiments, theories and prescriptions are, almost without exception, bad. Two of his essays are medical in content, viz., "Of Regiment of Health" and "Of Deformity." Some sentences from the latter anticipate the Inferiority Complex of Adler:

"Whoever hath anything fixed in his person that doth induce contempt hath also a perpetual spur in himself to reseue and deliver himself from scorn. Therefore all deformed persons are extreme bold, first, in their own defence, as being exposed to scorn, but in process of time by a general habit . . . so that upon the matter, in a great wit, deformity is an advantage to rising."

Inferior as is the quality of Elizabethan prose, scientific or secular, the blank verse of the great dramatists of the period turns out to be, on the other hand, a highly effective medium for the expression of scientific ideas and current medical doctrine. Open the Elizabethan and Jacobean dramatists anywhere and you will find them saturated with the medical thought of the time, not merely the superstitious medical lore and therapeutic practices which Dr. Robert Fletcher analyzed so effectively in his well-known paper of 1895, but sound, sensible medical thinking which is sometimes startlingly modern. Thus, the use of opiates and other "drowsy syrups" in surgery, which went on up to the introduction of ether and chloroform anæsthesia (1847), is clearly indicated by Massinger—

"We have given her, sir,
A sleepy potion, that will hold her long
That she may be less sensible to the torment
The searching of her wound will put her to."

The Duke of Milan, V, 12.

and Middleton—

"I'll imitate the pities of old surgeons
To this lost limb, who, ere they show their art,
Cast one asleep, then cut the diseased part."

Women beware Women, IV, 1.

Again, the doctrine of contagion, that infectious diseases are communicable, while but vaguely surmised by Lucretius, Virgil, Livy and a few other superior minds among the ancients, is clearly expressed in Shakespeare:

"Men take diseases of one another."

II Henry IV, 5.

"Tis time to give them physic: Their diseases are grown so catching."

Henry VIII, I, 2.

As also the theory of mother-wit, that a man's mental capacity derives from his mother—

"That such a crafty devil as his mother,
Should yield the world this ass."³

Cymbeline, II, 1.

Or that all work and no play makes the body to grow stale with the toxins of fatigue:

"Why universal plodding poisons up
The nimble spirit in the arteries."

Love's Labors Lost, IV, 3.

The Hippocratic aphorism about simultaneous pains in different parts of the body (II, 42) is expressed by Shakespeare with the utmost simplicity:

"One pain is lessened by another's anguish."

Romeo and Juliet, I, 2,

and again—

"But where the greater malady is fixed,
The less is scarcely felt."

King Lear, III, 4.

All along the line, Elizabethan blank verse is seen to be far superior to the medical prose of the period in the terse statement of scientific thought, and in no other period have the literature of England and France been so profoundly influenced by the terminology and ideation of science as in the 16th century. In this regard, the Elizabethan drama is comparable with the *Divina Commedia* of Dante, in which all the scientific ideas and notions of the Middle Ages are embalmed, like flies in amber. Would it be possible, for instance, to state more clearly than Shakespeare, the modern doctrine of behaviorism, that through the sym-

³This theory of the inheritance of mentality, favored by Schopenhauer and supported by the sportman's proverb, *Chien de chienne et chienne de chien*, is further illustrated in Middleton's *A Fair Quarrel*, I, 1.

"Wise men beget fools, and fools are the fathers

To many wise children; *hysteron proteron*,

A great scholar may beget an idiot,

And from the plough-tail may come a great scholar."

pathetic nervous system, the body also thinks, that we move by means of striped or voluntary muscle, but are moved by smooth or involuntary muscle:

"There's language in her eye, her cheek, her lip,
Nay her foot speaks, her wanton spirits look out
At every joint and motive of her body."

Troilus and Cressida, IV, 5,

or, in the lines of another poet of the period—

"Her pure and eloquent blood
Spoke in her cheeks and so distinctly wrought
That one might almost say her body thought."

John Donne: *Elegy on Mistress Drury*.

Or take the old doctrine of cruentation, that the wounds of the murdered will bleed spontaneously on the presence of the murderer, as conveyed in *Richard III* (I,2):

"Dead Henry's wounds
Open their congealed mouths and bleed afresh.
Blush! Blush! thou lump of foul deformity
For tis thy presence that exhales this blood
From cold and empty veins where no blood dwells."

Or the old Alexandrian theory that the blood vessels arise from the liver, in *Marlowe's Tamburlaine* (II, III, 4):

"I feel my liver pierced and all my veins,
That there begin and nourish every part,
Mangled and torn."

The ancient notion of Aristotle that the heart thinks, is the seat of reason and intelligence, persisted long after Harvey's time and is even now current in such phrases as "hard hearted" (for tough-minded); "Get it by heart" (for memorize it), or "at heart" (for inmost mind). St. Matthew's "out of the heart the mouth speaketh" is paralleled by Hamlet's "Would heart of man once think it?" or Coriolanus ("His heart's his mouth.")

Nearly every book on history of medicine begins with the intelligence displayed by the dog in licking its wounds, splintering an injured limb by hopping about on three legs or seeking out grasses for emetic purposes. And with what droll humor is all this conveyed in the dry Saxon English of a play of 1593 by Thomas Nash—

"That dogs physicians are, thus I infer,
 They are ne'er sick but they know their disease,
 And find out means to ease them of their grief;
 Special good surgeons to cure dangerous wounds,
 For stricken with a stake into the flesh
 This policy they use to get it out:
 They trail one of their feet upon the ground,
 And gnaw the flesh about where the wound is,
 Till it be clean drawn out; and then, because
 Ulcers and sores kept foul are hardly cured,
 They lick and purify (them) with their tongue,
 And well observe Hippocrates' old rule,
 The only medicine for the foot is rest;
 For if they have the least hurt in their feet,
 They bear them up and look they be not stirr'd.
 When humours rise they eat a soverign herb,
 Whereby what clogs their stomach they cast up;
 And as some writers of experience tell,
 They were the first invented vomiting."⁴

Elizabethan blank verse, in brief, justifies the dictum of Alfred Noyes that "there is no precision of expression like the precision of great poetry." In the 17th century, which Osler regarded as the most interesting period of English history and literature, British medicine comes into its own. The half century of Elizabeth's reign ended in 1603. In 1616, the year of Shakespeare's death, Harvey completed his demonstration of the circulation of the blood, which he published 12 years later in 1628. This was four years before the birth of Sydenham whose place among the English clinicians is as that of Marlborough, Wellington and Nelson in the military and naval pantheon of Britain. Sydenham's original descriptions of dysentery (1669-76), scarlatina (1675), hysteria (1682), gout (1683), chorea minor (1686, bronchopneumonia and pleuropneumonia, diseases he put on the map, came toward the end of the century. As Harvey and Sydenham wrote in Latin exclusively, we can judge of their position in English medical literature by translations only. Even so, there is an end of the turgid, redundant, expansive quality of Elizabethan medical prose, which trails off in the quaint imagery, or

⁴Cited by Fletcher; *Johns Hopkins Hosp. Bull.*, Balt., 1895, VI, 83.

nate locution yet wholly understandable diction of Sir Thomas Browne. In the century which began with Gilbert's book on the magnet and the production of Hamlet, English prose had acquired something of the Puritan sobriety, economy and austerity, in other words, was already by way of being an effective vehicle for the expression of scientific thought. The sentences of Harvey and Sydenham are simple in construction, straight-shooting, in the sense of going directly to the point without circumlocution, hence unmistakable in meaning and understandable on the instant. Three centuries before the advent of laboratory telegrams from the heart by the string galvanometer, Harvey describes that dissociation of the rhythms of auricle and ventricle known as heart-block, and does it in a single sentence, adumbrating the two, and three-time gallops of the recent clinicians:

"While the heart gradually dies, it sometimes responds with a single weak and feeble beat or two or three pulsations of the auricles."

Three centuries again, before the modern laboratory experimenters, Harvey revives a quiescent heart by wetting it with saliva on his finger:

"Once in an experiment in a pigeon, after the heart had stopped and even the auricles had stood still for some time, I rested my finger warm and wet with saliva upon it. By this warm application, it recovered life and strength. The auricles and ventricles beat, alternately contracting and relaxing, as if called back from death."

But to sense the alert intelligence and zest of life in the man called Harvey, let us peruse his account of the Bass Rock, off the coast of Scotland, an interlude in his treatise on embryology (1651), which reads like a page out of Defoe or Stevenson's *Catriona*:

"There is a small island which the Scots call the Bass Island (and speaking of this one will suffice for all) situated in the open ocean, not far from the shore, of the most abrupt and precipitous character, so that it rather resembles one huge rock or stone than an island, and indeed it is not more than a mile in circumference. The surface of this island in the months of May and June, is almost completely covered with nests, eggs, and young birds, so that you can scarce find free footing anywhere; and then such is the density of the flight of the old birds above, that like a cloud they darken the sun and the sky; and such the screaming and din that you can scarce hear the voice of one who addresses you. If you turn your eyes below, and

from your lofty stance and precipice regard the sea, there you perceive on all sides around an infinite variety of different kinds of sea-fowl swimming about in pursuit of their prey: the face of the ocean is very like that of a pool in the spring season, when it appears swarming with frogs; or to those sunny hills and eliffy mountains looked at from below, that are covered with numerous flocks of sheep and goats. If you sail round the island and look up, you see on every ledge and shelf, and recess, innumerable flocks of birds of almost every size and order; more numerous than the stars that appear in the unclouded moonless sky; and if you regard the flights that incessantly come and go you may imagine that it is a mighty swarm of bees you have before you. The whole island appears of a brilliant white colour to those who approach it,—all the cliffs look as if they consisted of the whitest chalk; the true colour of the rock, however, is dusky and black. It is a friable white crust that is spread over all, which gives the island its whiteness and splendour, a crust having the same consistency, colour, and nature as an egg-shell, which plasters everything with a hard, though friable and testaceous kind of covering. The lower part of the rock, laved by the ebbing and flowing tide, preserves its native colour, and clearly shows that the whiteness of the superior parts is due to the liquid excrements, white, hard and brittle like the shell of the egg, cover the rock, and, under the influence of the cold of the air, encrust it. Now this is precisely the way in which Aristotle and Pliny will have it that the shell of the egg is formed."

The literary manner of Sydenham is graver, more serious and sober-sided, yet equally plain, simple and understandable:

"A man is as old as his arteries."

"The selfsame phenomena that you would observe in the sickness of a Socrates, you would observe in the sickness of a simpleton."

"Fever itself is Nature's instrument."

"Merely to enumerate all the symptoms of hysteria would take a long day, so many are they. Yet not more numerous than varied, proteiform and chameleonlike."

"Gout, unlike any other disease, kills more rich men than poor, more wise men than simple. Great kings, emperors, generals, admirals and philosophers have all died of gout."

It is not without reason that Aristotle has observed that melancholy men are men of highest genius.

"As indeed, no man can say who it was that first invented the use of clothes and houses against the inclemency of the weather, so also can no investigator point out the origin of medicine, mysterious as the source of the Nile. There has never been a time when it was not."

Even in these plain, sober-sided sentences, you will perceive what Dryden had in mind when he wrote of "the other harmony of prose."

The same simple, plain, direct, understandable mode of expression is discernible, not only in the medical allusions in the King James Bible of 1611; but particularly in the verse of the dramatists and poets of the Jacobean period. What once took a page or paragraph is now said in a single line or sentence, e. g., the utterance of Satan in *Paradise Lost*, perhaps the wittiest single line in blank verse:

"Not to know me argues yourself unknown."

Thus, George Herbert conveys the idea of focal infection by the mouth—

"Look to thy mouth: diseases enter there."

In a single line, Dryden contrasts the Harveian doctrine of the circulation with the old Galenic notion of a tidal, shuttlewise ebb and flow—

"The circling streams once thought but pools of blood,"

and abounds in terse psychological observations of peculiar interest to physicians, such as the fiery soul fretting the pygmy body to decay, or "Great wits are sure to madness near allied," or "Stiff in opinions, always in the wrong," or "Beware the fury of a patient man," or "For every inch that is not fool is rogue," or the big-boy complex ("Men are but children of a larger growth"), or the tendency of the lover to credit his beloved with supernal perfections not always discernible to rank outsiders—what Mencken calls "editing his girl—"

"The cause of love can never be assigned:

'Tis in no face, but in the lover's mind."

Milton thus summarizes the archaic pathology of his own blindness (*gutta serena*):

"So thick a drop serene hath quenched their orbs,"

and describes the Archangel as purging the visual nerve of Adam with euphrasy and rue, "for he had much to see."⁵

⁵Milton's blindness is reflected in his many references to effects of light, notably "darkness visible," "the palpable obscure," "dim religious light," "dark with excessive bright," "streaming light" and "the gay motes that

Butler, in *Hudibras*, says, "No man of himself doth catch," in other words, is not infected by infections already within him; but the supposed reference to the beneficial or antagonistic effect of one disease upon another in *Romeo and Juliet* (1591-2)—

"Take then some new infection to thine eye,

And the rank poison of the old will die," I, 2,

is merely a fanciful conceit of Benyolio, to the tune of "Off with the old love, on with the new."

It is known that the Black Death and the Hundred Years' War set back civilization and sterilized intellectual productivity in Europe for over a century. How well this devastation is conveyed in three stately lines of the dramatist Shirley—

"Devouring Famine, Plague and War

Each able to undo mankind,

Death's servile emissaries are."

Contrast these straightforward utterances with the droll solemnity and prolixity of Francis Beaumont's elegy on the death of the Countess of Rutland, sister of Sir Philip Sidney. The poet actually imputes the death of this great lady to neglect of practical anatomy, better still to the fact that dead bodies for dissecting were seldom, if ever, available from the higher ranks of society:

"I will show the hidden reason, why you did not know,

The way to cure her; you believ'd her blood

Ran in such courses as you understood

By lectures; you believed her arteries

Grew as they do in your anatomies,

Forgetting that the State allows us none

But only whores and thieves to practise on.

..... Had you seen

Penelope dissected or the Queen

Of Sheba then you might have found a way

To have preserved her from that fatal day." ⁶

⁶Cited by Fletcher: *op. cit.*, 75.

people the sunbeam." His astronomy is mainly Ptolemaic and he favored astrology, but his remarkable knowledge of geography, botany, and zoology is evidence of his vast reading.

In "The Purple Island" (1633), Phineas Fletcher attempted an allegory of the anatomy of the human body in twelve lengthy cantos of verse.

We have travelled a long distance, indeed, from such verbose, extravagant fantasy to terse, sober reality. Yet let us not forget that such admirable poets as Thomas Lodge, Thomas Campion and Henry Vaughan, the Silurist, were practising physicians, like Sir Thomas Browne, that master of what Guy Patin called "strange and ravishing thoughts." The 17th century was an age of laboratory investigation in medical science, in which the general practice of medicine and surgery sank to a level not much better, sometimes, than that of savage tribes. Three specimens of its remorseless objective realism shed great light on the medicine of the period: Butler's *Hudibras*, Pepys' *Diary* and Defoe's *Journal of the Plague Year*, which Dr. Warren Nicholson has shown to be not fictitious, as commonly supposed, but solidly based upon the medical pamphlets and statistical records of 1665. The Plague Pamphlets of the dramatist Thomas Dekker are of unique cultural value with regard to the social aspects of this Great Plague of 1665. The Letters of Anne, Viscountess Conway, recently edited by Professor Marjorie Hope Nicholson, of Yale, afford perhaps the best sidelight we have on the degradation of medical practice in the 17th century. Even Harvey was an indifferent bedside doctor and began to lose patients after the publication of his masterpiece of 1628. Apart from Butler, the medical satirist of the period was Gideon Harvey, in his scurrilous *Conclave of Physicians* (1683). *The Artificial Changeling* (1650) of the physician John Bulwer deals with the artificial production of monsters by "reversed orthopedics" (*chirurgie au rebours*), which is the theme of Victor Hugo's *L'homme qui rit*.

In the middle of the 18th century, William Cullen, one of the leading Scottish practitioners of the period, began to lecture in English instead of Latin, and from that time on, English physicians lectured, wrote and published in the vernacular. At this time of day, it seems strange that

Morgan, Shippen, Rush and Samuel Bard, founders of medical education in the United States, should have published inaugural dissertations in Latin, along with 60 other American medical graduates of the University of Edinburgh, during 1758-88. The custom began to die out with Cullen and trailed off in the Latin salutatories and valedictories of our schoolboy days. Of the greater English physicians of the 18th century, John Hunter and Edward Jenner were mediocre writers of English. Jenner's initial tract on vaccination (1798) is notable for the poor arrangement of the material, great as is his argument. His literary manner, like that of his poems, is distinctly dull. John Hunter, one of the three greatest surgeons in history, was well-nigh inarticulate in the expression of thought. He employed such meaningless expressions as "the irritation of imperfection" or "the stimulus of death," regarded the fluid constituents of the body as sentient beings, and even wrote of "the blood's consciousness of being a useful part of the body." In plain English, he was a *primitif*, with the primitive tendency to personify the impersonal, which is never far to seek, in the light of Goethe's dictum: "Man knows not how anthropomorphic he is." Hunter and Jenner were men of action in medicine and are best judged by what they did, the experiments they performed and their outcome, rather than by anything they said in print. Hunter is best remembered by his curt, straightforward, word-of-mouth utterances, such as his advice to Jenner on the necessity of experimental accumulation of fact before formulating theories: "Don't think, try"; or on his plight as a rejected lover: "Let her go and never mind her. I shall occupy you with hedgehogs."

The best English masters of medicine in the 18th century—Lettsom, Fothergill, Young, Wells, Withering, Pott, William Hunter—were facile masters of the peculiar sober-sided literary manner of precise and formal gait, which characterized the age of periwigs, three-cornered hats, ruffles, Geneva bands, brocaded coats, small clothes, buckled shoes and gold headed canes. Of this periwigged, slightly pompous manner Cadogan whose Essay on Gout has been

edited by John Ruhräh, is the most exquisite example, while such effective and active sanitarians as Sir John Pringle, Charles White and Sir George Baker are more notable for native fire. Heberden, the greatest English bedside physician after Sydenham, wrote mainly in Latin, but his one English pamphlet, *Antitheriaka* (1745), an onslaught on the filthy and foolish ingredients of the London Pharmacopœia, is an admirable specimen of the stately, dignified, withal artificial manner of the 18th century, the age in which manner was of more consequence than matter, formality and form more highly esteemed than worth and substance. Of the poets, writers and wits who may have foregathered in Wills' Tavern, Goldsmith, Garth, Arbuthnot, Blackmore, Akenside, were medical graduates, and Smollett was a naval surgeon. Many sidelights on the medicine and sanitation of the time are afforded in the poems of Crabbe, Cowper and Pope.⁷ Slowly, but surely the medical writers of the period were approximating to that plain, pedestrian prose of unmistakable meaning, which, however dry or dull, is the essential literary vehicle of scientific research, the impersonal, factual manner of a military or official report, which Stendhal ultimately imported into the writing of fiction. Through the first half of the 19th century, this steady progression toward an effective norm of expression is perceptible in the writings of Bright, Addison, Hodgkin, Stokes, Graves, Astley Cooper and other English clinicians and surgeons down to the time of Lister and Osler. Cullen's *First Lines of Physic*, which was used even by the forty-niners of the Californian gold rush, was succeeded by the treatise on medical practice of Sir Thomas Watson, an exceedingly well-written and informing vol-

Thus, Crabbe on quack medicines—

"From the poor man's pay

The nostrum takes no small amount away";

or Cowper's reference to gout as—

"Pangs arthritic that infest the toe

Of libertine excess";

or Pope on the insect eye:

"Why has not man a microscopic eye?

For this plain reason—man is not a fly."

ume, which eventually gave place to the editions of Osler. In the Georgian period, wealthy or well-to-do physicians began to publish, at their own expense, very elaborate quarto volumes of travels in distant regions, of the keepsake order, often illustrated by themselves. This fashion was started apparently by Alexander Russell, half brother of the delineator of Russell's viper (See Conan Doyle's snake story), in two expensive keepsake volumes in calf on Aleppo (1794). The vogue was continued in similar volumes on Iceland by Sir Henry Holland, Italy by John Bell, Lower Hungary by Richard Bright, Morocco by Thomas Hodgkin and Constantinople by William Mac Michael, author of *The Gold Headed Cane*. About the middle of the 19th century, Sir William Wilde, father of Oscar and pioneer in the surgery of the ear, started the long procession of volumes on European travel, taken up even by such American physicians as William Gibson and Valentine Mott and of which the end is not yet. Literary and artistic diversions came to be a favored hobby of doctors in the 19th century. Very readable English translations of the Greek and Latin medical classics were made by Francis Adams, Alexander Lee, William Alexander Greenhill and Edward T. Withington. Bright, Hodgkin, the Bells, Sir Robert Carswell, Sir Richard Owen and Lord Lister illustrated their own investigations. The surgeon, Sir Seymour Hayden, was one of the most gifted and prized of modern etchers. Novels about medicine by doctors, from Samuel Warren's "Ten Thousand a Year" to Holmes, Weir Mitchell and Oliver, make a long list. Keats was an apothecary's apprentice. Thomas Lovell Beddoes heads a long row of 19th century doctor poets, such as McCrae and Ronald Ross, culminating in the laureate, Dr. Robert Bridges. The poems of two living leaders of British physiology, Henry Head and Sherrington (*The Assaying of Brabantius*) deserve a place in any anthology. One of the most charming mementoes of the association of medicine and literature is the little book of Dr. John Brown of Edinboro on Rab and Marjorie Fleming. Sir Walter Scott's little pet, who said that seven times

seven is devilish, but eight times eight more than human nature can endure. Marjorie's observations on the comparative psychology of turkeys are as fresh and piquant as when she wrote them, before her death at the age of eight:

"Three turkeys fair their last have breathed,
And now this world forever leaved;
Their father and their mother too,
They sigh and weep the same as you;
Indeed the rats their bones have crunched,
Into eternity they're launched.
A direful death indeed they had,
As wad put any parent mad.
But she was more than usual calm,
She did not give a single dam."

"We fear (she) is the abandoned mother" is Dr. Brown's running comment.

On the whole, the ablest man of letters in the medical profession was Thomas Henry Huxley, who was, indeed, the most vigorous and forceful English writer of his period, whose sentences, as John Burroughs said, are like so many javelins attaining their mark:

"Science commits suicide when it adopts a creed. Ecclesiasticism in science is only unfaithfulness to truth."

"The great tragedy of science—the slaying of a beautiful hypothesis by an ugly fact."

"The man of science has learned to believe in justification, not by faith, but by verification."

"It is better for a man to go wrong in freedom than to go right in chains."

"Better live a crossing sweeper than to die and be made to talk twaddle by a medium at a guinea a *séance*."

"Science reckons many prophets, but there is not even the promise of a Messiah."

"Books are the money of literature but the counters of science."

"Nature's discipline is not even a word and a blow, but the blow without the word."

"Thoughtfulness for others, generosity, modesty and self-respect are the qualities which make a real gentleman or lady as distinguished from the veneered article which commonly goes by the name."

Until latterly, English physicians have not tended to be so autobiographical as the German, and where they have written about their own lives, as in the case of Astley Cooper or Huxley, the record has seldom occupied more

than a page or so. On the other hand, the medical literature of England numbers several well executed and very readable biographies of physicians, among them Stephen Paget's lives of John Hunter, Victor Horsley, Sir James Paget and Ambroise Paré, Sir Michael Foster's Claude Bernard, Lonsdale's Robert Knox, Fothergill by Hingston Fox, and above all, Cushing's great two volume life of Osler. The literary tradition in English medicine culminates, in fact, in the two Regius professors of medicine at Cambridge and Oxford, Allbutt and Osler, whom Osler himself facetiously dubbed the Brothers Regii. Their literary diversions were largely confined to the history of medicine, which became a going concern in America through the pioneer efforts of Billings, Osler and Welch. In this field, Sir Clifford Allbutt was much the profounder scholar of the two, but even the professional writings of both are replete with historic allusions. In fact, a student once got up a burlesque examination paper on the very recondite cultural allusions in Osler's Practice, one of the most readable books on medicine ever written. Reading Allbutt for the first time is like reading Browning. You feel at times the need of a key or footnotes, to set off the erudition which the writer takes for granted in his readers. The most charming contribution of Osler is his Alabama Student, which has been as widely read as his Practice and has been a source of inspiration to us all. Allbutt's main contributions are his books on Science and Mediaeval Thought (1901), on the Composition of Scientific Papers (1904), on the Historical Relations of Medicine and Surgery to the End of the Sixteenth Century (1905) and on Greek Medicine in Rome (1921). Of his literary manner, we may say, as Johnson said of Burke, that he winds into his subject like a serpent, in fact, as one finds in reading Burke, you will not appreciate him except in very wide-awake moods. There is the same close, sinuous, intricate reasoning, sustained at a very leisurely tempo, which we find in Burke. In his book on the composition of scientific papers, Allbutt refers modestly to our "vacuous minds" and cites the dictum of Plato: "False words are

not in themselves evil, but they infect the soul with evil." Enlarging upon Sheridan's witticism that "Easy writing is damned hard reading," he says:

"It must not be supposed that mere literary form is but a toilette, a skin-deep quality. As a young student is now educated, it is hard for him to dress his matter so that it flows easily into the mind of the reader. He is apt to think that an easy style comes of letting himself go, and that a glaze can be put on by any tiresome pendant. He is unaware that an easy, limpid consecutive style is the result of consummate craftsmanship. No quality was won by more labor than for example, the ease of Montaigne; no manuscript was more anxiously revised and corrected than his. As Pope put it:

"True ease in writing comes from art not chance,
As those move easiest who have learned to dance."

In other words, Allbutt clearly recognized that what is spoken or written for the ear is seldom acceptable to the eye, and *vice versa*. The literature of antiquity, laboriously copied by scribes in periods when even a mediæval prayer book or Book of Hours cost about the equivalent of \$5,000 because it took about five years hard labor to produce it, much of this literature was written for the ear, was intended to be overheard by those who could not afford to purchase it, which is the key to our understanding of it and the reason for our many difficulties with it.⁸ On the other hand, most of us are behind spectacles today on account of the gigantic proliferation and relative cheapness of literature written for the eye.

On the many allusions to medicine in modern English literature, it will not be necessary to dwell. One is mindful of the bywords about carrying owls to Athens or coals to Newcastle. "Ever since the Crimean War," Dr. Weir Mitchell once observed, "nurses have been getting into novels," and it is no exaggeration to say that very few of our sensational murder and sex novels of today are without a doctor or something about doctoring. The tradition began with the Victorian novelists, Dickens, Thackeray, Charles Reade. Wilkie Collins, whose portrayals of dif-

⁸Segnius irritant animos demissa per aurem,
Quam quæ sunt oculis subjecta fidelibus" Horace.

ferent types of Victorian physicians are, all of them, surpassed by George Eliot's Lydgate in *Middlemarch*, now known to be a full length portrait of Sir Clifford Allbutt himself. Charles Reade's notes on the talent of Celtic physicians for rapid generalization in diagnosis, outstanding in such great bedside doctors as Laennec and Osler, makes his *Hard Cash* one of the greater novels about medicine, particularly in its account of the pauperization and penalization of the insane in poor-house prisons called asylums in lieu of humane medical treatment in hospital. Episodes in the history of medicine have been latterly depicted even in verse. Along with Browning's *Paracelsus*, his *Artemis Prologuizes* and Edith Wharton's *Vesalius in Zante*, comes a notable recent example in Alfred Noyes' three-volume epic on the progress of science, *The Torch Bearers* (1930). Its terminal volume deals with such major episodes as Vesalius, Harvey and Bacon, Huxley and Bishop Wilberforce, Pasteur and Renan, all circling round a surgical contretemps at sea:

"No hope unless I operate. It's a risk.
One chance in a thousand. If only we could have made
New York in time. Johns Hopkins has a man
That [*sic*] might have saved her."

In spite of this poet's predilection for trite moralizing and obligato religiosity, these profuse volumes do convey not a little of the magnitude and importance which science has latterly acquired in the world's economy, yet somehow we are mindful of the sound argument of the late Dr. W. C. Rivers:⁹

"Tolstoi said the work of the artist was to communicate emotion . . . The scientist does not remould the world after his heart's desire; he finds out how the old one is governed. His appeal is not to emotion, but intellect . . . Only the humbugs of the public platform attribute altruism to the medical discoverer, and it must have been delightful to hear Helmholtz with German candor, tell his conventional congratulators publicly that he was not moved at all by benevolence in inventing the ophthalmoscope, but by curiosity to answer questions that had occurred to him . . . The time when one misses one's scientific friends is when artists begin to talk about

⁹Rivers: *Through a Co sulting Room Window*, London, 1926, 125-131.

causation; they are so sure of everything, and they run up additional wings to the edifice with so great rapidity—heedless, artist-like, as to whether they can keep up the huge establishment or not. I wonder how I bore them. They are polite people, politer than the other side, and there is little chance to know.”

Science and Faith, as Virchow said, are mutually exclusive, and no possible good can accrue to either by hashing them up together. One of the clearest thinkers on this theme was Sir William Gull, whose deep religious feeling, something private, peculiar and personal to himself, did not interfere in the least with his skill in differentiating adult myxœdema, the posterior spinal lesions of locomotor ataxia or the arterio-capillary sclerosis of Bright’s disease. Like Ben Franklin or Claude Bernard, Gull regarded scientific skepticism in the affairs of the material world as an overcoat, to be put on or off as occasion requires. He quotes St. Augustine to the effect that some things must be known in order to be believed, some things must be believed in order to be known. “The antithesis of Faith,” he says, “is inquiry,” but, “things may be opposite without being contrary,” just as the North Pole is conditioned by the existence of a South Pole. Science, as Stuart Mill observed, is not so much opposed to the spirit of poetry, as to rhetoric, oratory, cheap journalism and special pleading. Like the ancient antagonism between theologian and scientist, the real opposition is not so much science *vs.* poetry, as between the vision and mental approach of the man of science, the poet or artist and the politician. The criterion of a poetic expression of scientific fact is that the statement should be made in some unique, concise, original way, which is luminous, inevitable, impersonal and informing, without *parti pris* or *argumentum ad hominem*. In our mechanized world of today, poetry has rather lost caste as a burble incapable of expressing anything whatever. As a medium for the expression of scientific fact, no body of English verse can surpass that of the Elizabethan and Jacobean, in other words, the Tudor and Stuart periods.

F. H. GARRISON.

ROBERT KOCH*

LAWRASON BROWN
Saranac Lake, N. Y.

We have gathered here tonight to do homage to the memory of two great medical men, of Hermann Biggs and of Robert Koch, one of the immortals of this earth, discoverer of the use of solid media in bacteriology, discoverer of the methods of sterilization against bacteria (thus making modern (aseptic) surgery possible), discoverer of tuberculin, discoverer among other bacteria of the tubercle bacillus, just fifty years ago, in fact the Father of scientific bacteriology. He takes his place with Pasteur and Lister among the great benefactors of mankind.

Born in 1843 in Clausthal, on the western or Hanover Slope of the Harz Mountains, a "perfect epitome of mineralogy," one of the elder of thirteen children (eleven boys), son of a Bergrat, a scientific superintendent of mines, Robert Hermann Heinrich Koch was frugally reared on black bread, sweet and butter milk, legumes, butter and cheese only at night, white bread Sunday mornings and meat twice a week. He knew such luxuries as coffee, sugar, tea, only by name. He received poor instruction in the local Gymnasium, where discipline was such that the teachers and not the pupils were at times chastised. Though he had announced that he would study philology, later he decided upon a mercantile career as he loved to travel. The family were ultimately able financially to send him to the University of Goettingen, where finally he studied medicine under Henle, Hasse and Meissner. His industry won for him a place in the pathological museum, and signing an essay on the Ganglion Cells of the Nerves of the Uterus with the phrase, *Nunquam otiosus*, never at leisure, he won a prize. He worked also on the origin of succinic acid in the body.

Graduating in 1866 at 19, after a short interneship in the general hospital in Hamburg, he accepted a position as

*Hermann Michael Biggs Memorial Lecture, delivered at The New York Academy of Medicine, May 5, 1932.

externe in a hospital for the insane at Langenhagen, near Hanover, and began private practice with the purchase of a riding horse. Shortly after graduating when he still had plans to become a ship's surgeon in order to see the world, he had become engaged, by promising to give up such ideas, to a boyhood sweetheart, Emmy Adolphine Josephine Fraats, also of Clausthal, daughter of a Lutheran clergyman. They were married in 1867, and a year later, Koch's only child, a daughter, Gertrude, was born. He made little headway financially, and resigned and moved to Niemegek but fared no better, and considered emigrating to America where he had two or three brothers. Moving again in July, 1869 to Posen he settled in Rakwitz, where he soon had a satisfactory practice and could afford to buy some experimental animals. Previously rejected on account of his near-sightedness, he voluntarily enlisted for the short Franco-Prussian War. On his return his practice increased and in 1872 he was appointed at a yearly salary of 900 marks district physician to Wollstein, a nearby town of 4,000 inhabitants, where he already enjoyed what consultation practice there was.

Near-sighted, rather slender, full-bearded, somewhat brusque, little given to society, a man of few words except to intimates, respected for his ability but hardly loved by his fellow citizens who saw little of him for he was the busiest physician in the village, he worked in his little laboratory, formed by curtaining off a portion of his private office. I doubt if the corner of any private office has ever meant so much to the suffering world. Here he placed a microtome, a home made incubator built by himself and an old fashioned microscope. He was unable to buy a modern microscope but his good wife by scrimping and saving finally collected, no doubt in an old stein, a fund sufficient to make him a present on his birthday of a new microscope such as he desired.

Koch had studied medicine for the reason that by doing so he might indulge in his hobby for natural history. He always found time to do some microscopic work and was especially interested in algae. At this time anthrax was

decimating the herds of cattle and the flocks of sheep of a large part of Europe, and when he had a little leisure he worked constantly upon this disease for, as he says, it was at hand. He had to devise all his implements but with his ingenuity this apparently caused him little difficulty; for example, he inoculated his mice from one to another with little slivers of wood.

In 1876 at the head of the Botanical Institute in Breslau was Ferdinand Cohn, the greatest figure in bacteriology before Koch, who had worked out the first morphological classification of bacteria, putting bacteria in the vegetable kingdom, and had found spores in *Bacillus Subtilis*, for up to this time bacteria were still considered a part of botany. The work of Schroeder on pigment bacteria, done under Cohn, is a classic.

On April 22, 1876, Cohn received a letter from Wollstein in Posen. "Esteemed Herr Professor," it modestly began, "Stimulated by your work on bacteria published in Contributions to the Biology of Plants, I have for some time been at work on investigations of anthrax contagium, as I was able to secure the necessary material. After many vain attempts, I have finally been successful in discovering the process of development of the *Bacillus anthracis*. After many experiments, I believe to be able to state the results of these researches with sufficient certainty. Before I bring this into the open I respectfully appeal to you, esteemed Herr Professor, as the foremost authority on bacteria, to give me your judgment regarding this discovery. Unfortunately I am unable to prove this by means of preparations containing the individual stages of development as the attempt to conserve the bacteria in the respective fluids has failed. I would, therefore, respectfully request you to permit me to show you, within the next few days, in the Botanical Institute, the essential experiments. Should you, highly esteemed Professor, be willing to grant my humble request, will you kindly appoint the time when I may come to Breslau? With the highest esteem, Yours Respectfully, R. Koch, District Physician."

Now Ferdinand Cohn himself had worked unsuccessfully on the problem of attempting to isolate a pure strain of bacteria for he realized that until this was done little advance could be expected. I have no doubt he was delighted to receive such a letter but I also feel sure that on account of previous disappointments he dared not let his hopes rise too high.

To grasp what all this meant to Cohn it is necessary to go back nearly a century to the time when Kirschner discovered and Leeuwenhoek improved the microscope, when was revealed to man for the first time a new world, so confused, so puzzling, that the findings were grouped by Linnaeus, the botanist, under the head of "Chaos." The germ theory of disease was not new. These discoveries opened the flood gates of wild and reckless speculation which were closed only when Jacob Henle wrote in 1840: "Before microscopic forms can be regarded as the cause of contagion in man they must be found constantly in the contagious material, they must be isolated from it and their strength tested." This, however, did not imply necessarily that the contagious material was living.

Up to this time none of the modern methods of investigating bacteria had been developed, and now we can readily see why Cohn was so delighted to get Koch's letter and to hear that Koch was willing to demonstrate and to prove his assertions.

Cohn spoke to a number of professors at Breslau about the matter and so, on April 30, 1876, he gathered them together. Cohnheim, delighted with such a three day demonstration said, "It leaves nothing more to be proved. I regard it as the greatest discovery ever made with bacteria and I believe that this is not the last time that this young Robert Koch will surprise and shame us by the brilliancy of his investigations." Saying this he rushed off to his own laboratory, called his assistants together, told them to drop everything and hasten to hear Koch.

Bringing with him some preparations and his own apparatus, Koch had demonstrated for the first time the life

cycle of a bacterium. His audience was of course delighted and Koch hurried to Berlin to submit his findings to Virchow, but the great man received him coolly which naturally depressed Koch. After over half a century the facts remain as Koch presented them.

The following year, 1878, Koch published his important communication, dealing with wound infection, not to be confused, however, with surgical wounds in man. In 1878 he attacked the views of Naegeli, who believed in the instability of bacteria in regard both to their pathogenic properties and to their morphology. At this time Koch began to long for a larger laboratory, for he was a born experimenter and needed expensive apparatus to carry on his various experiments.

In 1879 his friends, having procured for him the position of city physician, paying him 1800 marks a year, Koch moved his family to Breslau but remained only three months. His position at Wollstein, paying him annually but 900 marks, had been held open and his old friends and patients received him with open arms.

It was with a heavy heart that he left Wollstein and his friends to go in 1880 to Berlin, where he felt a field of wider usefulness lay before him.

In July 1880 Koch began work with the Imperial Health Office in Berlin where for some time bacteriology had been at a low ebb. Gathering about him such associates as Gaffky, Loeffler, Gaertner, Proskauer, Wolffhuegel, Huppe, B. Fischer, he began what we might call the Golden Age of Bacteriology. Koch himself referred to it as a period when the gold lay upon the surface and all that one had to do was to pick it up but one had to distinguish what was gold. In September 1881, Koch made what is considered by many to be his greatest contribution to bacteriology, his poured-plate method of obtaining pure cultures from mixtures of germs, published in the Contributions from the Imperial Health Office. Indeed this, with the second volume, might be called the corner stone of the science of bacteriology. It laid also the foundation for

aseptic surgery. But even at this time Koch had clearly in mind that some diseases might be due to microorganisms other than bacteria.

This publication marks the close of the first period of Koch's scientific work, at the beginning of which he found bacteriology in a chaotic condition, and at the end (1881) left it, due largely to his efforts alone, a well organized science, based in part upon his four postulates for connecting etiologically any bacterium with a certain disease. Not only the broad principles, settling once for all time the germ theory of disease, but also the little details of technic, the knacks which change failure into success, were largely due to Koch's great ingenuity. A Master had arisen and Bacteriology was now a medical science.

All those who knew Koch intimately were aware that no subject interested him as much as tuberculosis. Cholera, bubonic plague and other pestilences he said, carried off their hundreds, even thousands, but tuberculosis claimed as victims in all civilized countries its ten-thousands. Few families escaped. In fact he was so impressed with the importance of tuberculosis that throughout his life, even to the very end, he let no opportunity escape to work upon this problem. Koch was ever intensely practical, keeping always clearly before him the practical application of his discoveries.

In the summer (August) of 1881 with the first volume of the *Communications* safely through the press, he turned his attention to tuberculosis, stimulated by the many failures of the leading scientists of the world.

It is necessary, in order for us to grasp the significance of Koch's work, to know something of the ideas in existence at that time concerning hygiene and tuberculosis. The germ theory until about this time held that the germ was not superimposed upon the patient and independent of him, it was something belonging to him and borrowing from him a sort of pathological vitality and ability to transport it elsewhere. The idea of a living virus, able to

be cultivated and modified outside the body was new with Pasteur.

It is Koch's work on tuberculosis that interests us chiefly and for us to understand its importance we must know something of the ideas in existence at that time concerning tuberculosis. Klencke in 1843 showed that tuberculosis might be transmitted by cow's milk. But many combatted these ideas and among them none was more commanding than the great Virchow who held that tubercles had no connection with the cheesy matter so common in pulmonary tuberculosis (caseous tuberculosis), and that the cheesy degeneration might follow a variety of causes. Niemeyer even went so far as to say that the worst thing that could happen to a consumptive was that he might become tuberculous. Virchow opposed all specificity in disease. The influence of Broussais, not Laennec, was strong in Germany. Heredity at this time was considered the most important factor in tuberculosis and in such unfortunates cold, humidity, dust, among other things might bring about the disease. But no germ had yet been proved to cause the disease though many accepted such a view. In a few years, however, (1865 and 1868), Villemin proved that "tuberculosis is the effect of a specific causal agent, of a virus," and that dried sputum was important as a source of the disease. His book is a model of scientific writing, but none is so difficult to convince as the self-satisfied. Cohnheim predicted, however, that soon someone would find "tubercle particles" as he called them in the tubercles and in the cheesy matter. Stimulated by this many set out at once to work on the problem; and in 1877 Klebs announced that he had found the cause of tuberculosis; Toussaint and Aufrechet did the same in 1881; and Baumgarten in 1882 made a similar claim. While it is probable that Baumgarten did really see the tubercle bacillus he was unable to stain it or to produce convincing proof of his belief.

You will recall that Koch was said to have begun his attack on tuberculosis really as a public health problem in the summer, probably August of 1881, and when spring

was but three days old, on March 24th, 1882, six months later, he had satisfied himself that he had solved the problem. Up to this time he had been his own severest critic. On March 24th he presented his data and conclusions before the Berlin Physiological Society, a small but influential society where frank discussion was the rule and rising ambition was often none too gently treated. The Society met in Dubois-Reymond's physiological laboratory, in a room now shown with just pride to visitors. That night when the speaker, flanked by Gaffky and Loeffler, finished reading his devastating communication all eyes turned on the great Virchow who had combatted the idea that caseation might be due to tuberculosis but, slumped in his chair, he manifested no desire to speak, for criticism he had none, and taking his hat he left the room in silence. "That evening remains graven in my memory," wrote Ehrlich later, "as the most majestic scientific event in which I have ever participated."

The paper was published Monday, April 10th, 1882 in the *Berliner klinische Wochenschrift* seventeen days after it was presented.

Koch began looking for the cause of the disease in tuberculous tissues, the usual method of procedure, employing the ordinary stains or dyes, but he failed. Then remembering that some bacteria stained better when the dye was slightly alkaline he added potash to his methylene blue and saw, after counterstaining with vesuvin, a brown dye which decolorized everything save the bacilli, very thin rods still blue in color $1/10,000$ inch long and one third as wide. Time and again he found these tiny rods but recalling his teacher Henle's requisite, what is necessary to connect in a causative way a germ with a disease, he attempted to grow them on various substances (media) but failed until he coagulated the blood serum of cattle and used it for growing the germs. I can see him going morning after morning to the incubator, six days, seven days, nine days and still no growth. And then on the tenth (or as the rumor has it, on the fifteenth to the twentieth day), you see his face light up. What are these little scales

and white specks? He has at last grown the germ and he carries them later through seventy generations. With the germ, so to speak, in hand he attempted to "test its strength," as his old teacher, Henle, said was necessary. Again and again he reproduced the disease in all types of animals. He finally grew the germs again from the animals and he had fulfilled all the conditions necessary. To accomplish such an amount of work in such a short time as six or seven months, especially when the slow growth of the tubercle bacillus is taken into consideration, seems incredible and Theobald Smith and Petroff frankly think it highly unlikely.

It is difficult for us today to comprehend how anyone could doubt Koch's logical and convincing conclusions in regard to the etiology of tuberculosis, but some did, and in 1883 we find Koch answering sarcastically some of his critics.

Two years after the discovery of the tubercle bacillus (1884) in the second and last volume of the "Communications"* appeared a more extended article. It is this article and not the briefer paper of 1882 from which we must judge Koch's work. Some statements in the first paper were toned down and the experimental evidence extended. Much work on tuberculosis had been done in the meantime, and here and there he mentions it as, for example, the improvements in staining the bacillus due to Ehrlich, Ziehl and others which he recommends. He also mentions later that Tyndall had first used coagulated blood serum as a medium for growing germs.

"The discovery of the tubercle bacillus," modestly wrote Koch, "merely proves the correctness of the contention of Cohnheim that tuberculosis is an infectious disease, which has until now been doubted by the majority of physicians. The addition of this conclusive proof is, I believe, however, a great gain. It furnishes us also with a new diagnostic sign. In the future the diagnosis in doubtful cases will be determined by the presence of the tuber-

*Afterwards they were called "Arbeiten."

cle bacillus in the lesions. To a large extent it does so today and the success of this method well supports my belief in the etiological rôle of the bacillus. Lastly we may earnestly hope that the discovery will aid us in the treatment of the disease. As far as our observations go, we can expect little, if anything from the actions of chemical agents upon the bacilli in the living body, and we must turn our main efforts to prophylaxis. This means, on the one hand, effective disinfection of tuberculous material, and on the other hand, the protection of healthy individuals from contact with the bacilli.

"It seems to me none too early to insist on active prophylactic measures against tuberculosis. But considering the enormous extent of the disease we must, in all steps which we undertake to combat it, reckon with social conditions, and consider just how far we may proceed in the right direction, if interferences and various disturbances and disadvantages are not to curtail the benefits."

So ends a masterpiece of medical literature. One of the most remarkable things in medical history is how little of moment has been added to our knowledge of the tubercle bacillus since the appearance of this contribution.

With the publication of this paper Koch reached the pinnacle of his fame. Indeed, some think the discovery of the tubercle bacillus was Koch's greatest achievement.* However that may be, until this time he was known only to scientists as a great scientist as he had so far attracted little attention from the world in general. His discovery of the tubercle bacillus, the cause of so much sickness and suffering throughout the whole world, made his name a household word.

The effect of this masterpiece upon experimentation, upon the prevention, the diagnosis and the treatment of tuberculosis was far-reaching. Those who had held that pulmonary tuberculosis was entirely an hereditary di-

*Those interested in more details of this fascinating subject should read Krause's delightful articles in the *Journal of the Outdoor Life*, March, April May and June, 1918.

sease faded into the background, and sanitarians the world over began laying plans to prevent a disease which caused at least $1/7$ of all the deaths, and $1/3$ of those at a time when man's efficiency was usually at its greatest. Half-hearted measures, frequently combatted by those who held the disease was not contagious, now gave place to those based on a sound, solid foundation. But how the disease spread from man to man and from animal to man was quickly inferred by everyone but still not definitely settled. However, here was the foundation stone which none might cast away and upon which our present prophylactic (preventive) measures were to be based though details must come later. Indeed upon and around tuberculosis has been built the great voluntary public health movement in America.

In animal experimentation the flood gates were again opened for here were laid bare unsolved problems that even the most stupid could easily perceive. If the bacillus could be killed the animal or patient would no doubt quickly recover. Every conceivable substance that might be supposed to affect bacteria was given by mouth, by injection and by inhalation. Hydrofluoric acid was inhaled until all the window panes and the mirrors were etched and ruined, and still the tubercle bacillus pursued the even tenor of its way in lung and other tissue. But in man they had reckoned without the host, and they sadly discovered that the bacillus was more resistant than man.

In the 1890's following von Behring's discovery of anti-toxin for diphtheria, innumerable attempts were made to find an antitoxin for tuberculosis but all without success.

It is interesting to recall how slow some good clinicians were in accepting the importance of the tubercle bacillus in diagnosis. Dr. Trudeau told me many years ago of a young Harvard student who, suspected of having pulmonary tuberculosis, was sent to him for diagnosis. Not long before this Trudeau had climbed the narrow steps to Prudden's little laboratory in New York to learn how to stain the tubercle bacillus. He was led to do this from his

study of Koch's paper of 1884 which Mr. Charles M. Lea of the medical publishing house of Philadelphia had been good enough to have translated for him, an act which was really at the bottom of the foundation of the Saranac Laboratory, as I mentioned. In the sputum of this young Harvard student he found many of the slender rods so well described by Koch, though in the patient's chest he could detect no evidence of disease. The family were not satisfied and took the boy to a leading specialist in New York, Dr. Alfred A. Loomis, himself a sufferer from the disease tuberculosis. Loomis, himself finally a victim of the disease, heard nothing abnormal in the patient's chest, pooh-pooched the idea of tuberculosis, and allowed the boy to return to Harvard. In a year or two he relapsed and eventually died. Few such instances were necessary before the value of the tubercle bacillus in diagnosis was fully grasped. But as soon as this was fully appreciated many concluded that every case of pulmonary tuberculosis must have tubercle bacilli in the sputum, which Koch's paper clearly led them to infer, and on the contrary, if the tubercle bacilli were not found the patient could not be suffering at that time from tuberculosis. It required many years to correct this error and when corrected many have gone too far and now attach too little significance in diagnosis to the presence or absence of the tubercle bacillus in the sputum.

Cholera, long a scourge of Europe, came from India by way of Egypt or Afghanistan. When in 1883 it had again reached Egypt both France and Germany sent commissions there to study the disease. While the French commission were first on the ground, Koch, who headed the German commission had previously found a comma bacillus in a specimen of the intestine of a cholera patient sent to him from India. Holding themselves at first aloof from one another, later the members of the two commissions became friendly, and the Germans were disturbed when they learned that the French were packing up preparatory to returning home. "Have they found the germ," Gaffky in some trepidation asked Koch. The two, however, decided

to ask frankly Roux and Thuilliers for permission to examine their specimens. This was granted and late that night Koch realized that the French had confused blood platelets, found normally, of course, in the blood, for pathogenic microorganisms. The next day Roux with drawn and white face came to tell them that Thuilliers had an acute and probably fatal case of cholera. Would Koch come to see him? Koch went and found the poor fellow with sunken eyes lying in extremis. Looking eagerly at Koch he asked in a greatly weakened voice, "Is . . . it . . . the . . . cholera . . . germ?" Koch glanced at Roux and then said to the expiring fellow worker, "Yes, you have found it." "Thank you," he whispered and again a little later, "Thanks." And then with pleasure in his eyes he quivered slightly and a few moments later Roux closed his eyes. At the funeral which was attended by the German Commission, Koch placed two wreaths upon his coffin saying, "They are simple but they are of laurel, such as are given to the brave."

However, many questioned Koch's findings covering the cholera bacillus and Pettenkofer went so far as to swallow a whole culture tube of virulent organisms without any apparent discomfort. In several other instances, however, workers thus infected died, and one who sided with Pettenkofer essayed to follow his example. Feeling upset he took, it was said, ninety-nine of the one hundred known cures for the disease. On his return from this successful expedition in 1884, Koch was welcomed in a manner seldom accorded to princes and given 100,000 marks from a grateful nation. On the other hand the scientific workers in America, who long had recognized Koch's great ability, sought to work under him.

After refusing a call to a professorship in Leipzig in 1885, Koch became the head of the New Hygienic Institute and a professor of hygiene in the University.

Lecturing bored Koch but he was ever present at the many conferences of his associates and a stimulation to all the workers. At this time Koch was in the middle

forties, stood above middle size, slender, symmetrically built, with dark brown hair and a full beard, wearing gold spectacles always on account of his nearsightedness, with a countenance remarkable for the depth of expression and strength of contour. In speaking he was clear and to the point, which he demanded from those with whom he had to do. To strangers he was reticent, particularly unneighborly if he thought curiosity led them to him. He was just the opposite with his associates, always ready to listen, to advise and to help. He was agreeable, affable, but not sympathetic. He began early in the morning to work which lasted until the late afternoon or evening. In spite of this he liked to "visit" over the wine and beer (Kneipen) particularly with his friends, his assistants and their wives. On these occasions and on the evenings devoted to references, which he held regularly, he astounded his companions by his remarkable memory and delighted them by recounting his many experiences. The work connected with teaching, for it was thought that the students of the university as well as the graduate students should have the privilege of coming into contact with him, he considered a burden. He read some of his important communications over with his assistants and weekly made "rounds" to discuss the problems he had set many to work upon. All problems of hygiene were studied and the Berlin water supply watched. With Flügge he started the Journal of Hygiene. To Welch he talked of coming to America.

Koch was a true German. In July (15) 1886 we find him planning a tramp through Switzerland and inviting to go with him as a guest a friend, hoping in this way to repay in part his debt to him.

In March (11th) 1887 he wrote: "Frau F. and you have been so kind to send us your congratulations for the engagement of our daughter. We thank you most kindly. My emotions are, as you may imagine, not only of the cheerful kind. For the time being we shall not be separated completely from our child and that is a comfort but in a few years the young couple will have to leave Berlin and our happy lives together will cease. But this is

the lot of parents, to be left alone when they are old, and they have to be contented knowing their children are happy." In 1888 his daughter married Dr. Edward Pfuhl, and about this time a certain coolness sprang up between Koch and his wife. In September (24) 1888 of the same year he wrote: "I myself am up to my ears in work and for this reason also lost my vacation trip this year which I badly needed to get rid of a stomach catarrh which has been bothering me several months and has worn me out considerably."

In 1889 and 1890 Koch apparently changed his scientific habits and his assistants saw little of him. When he was able to work along scientific lines, in order not to be disturbed, he worked behind closed doors, and only his closest intimates knew what he was doing.

At the International Congress of Medicine, held in Berlin in 1890, in an address on "Bacteriological Investigations," he announced the discovery of a substance which in the test tube or in the animal body hindered the growth of the tubercle bacillus so that guinea-pigs given this substance failed to become infected when injected and such as were in an advanced stage of the disease had the disease arrested and all without harm to the animal. He gives no details as to the preparation of the remedy and states that his work is not yet concluded. He went on to say that the substance does not affect the bacilli but does kill the living tuberculous tissue, and the dead tissue should be removed surgically when possible. In the initial stage of phthisis the patients are always, in four to six weeks, so freed from all symptoms that they can be considered cured. Incipient phthisis can be assumed to be cured with certainty. In far advanced cases with large cavities it may help but little. The world stood aghast and delighted. "No medical discovery," wrote Trudeau, "has ever produced such a sensation as the startling announcement coming from the great scientist who had discovered the tubercle bacillus. Medical men from all over the civilized world flocked to Berlin to witness the effect of the remedy and to obtain some for their own use if

possible. A thousand dollars were freely offered for a bottle of tuberculin which contained about a teaspoonful, and the substance could not be procured at that price from those who had been fortunate enough to obtain some. Crowds paraded the streets in Berlin chanting hymns in Koch's honor and shouting his name." Biggs, Loomis and many others took the first boat for Europe. Many patients in Saranac Lake packed their trunks and left for New York to be near the docks so as to lose none of the few precious days that remained to them. And then came the sad realization of the truth. Overdosage and disastrous reactions occurred, followed apparently in a few far advanced cases by death. Virchow said it spread the disease but this is doubtful. Great resentment arose, and much abuse was heaped upon Koch, who through it all remained silent and at work. In November, 1890, you may recall Trudeau published the failure of his attempts to immunize guinea-pigs and rabbits by the injection of filtered and sterilized liquid cultures, really unconcentrated tuberculin. It was rumored that high authorities (even Emperor William some whispered) had forced Koch to make a premature announcement; but again and again he writes of new tuberculins, and in April, 1897 he describes "T. R.", tuberculin residuum, capable of protecting guineapigs against subsequent virulent inoculations, stating that "anything better of that kind cannot be made, and whatever is to be gained by tubercle cultures must be obtained by means of this preparation."

Again, as Trudeau points out, he fails to bring evidence of his claim. "I succeeded," Koch wrote, "in rendering a large number of guineapigs completely immune, so that they submitted to repeated inoculations with various cultures without being infected." It is difficult for us now to see how Koch could have been so misled, but he gives no protocols to uphold such assertions.

Koch's great eagerness to make practical use of his discoveries played a prominent part in all of his work. During the earlier years it was of immense benefit but later in his life it tended to lead him astray, possibly to entice

him to draw conclusions based on insufficient evidence. This unfortunate eagerness, so little manifested in the earlier years of his life, have led some to state that with the publication of his article on the discovery of the tubercle bacillus he reached the pinnacle of his career. They are probably correct.

In 1901, in his paper on the Agglutination of Tubercle Bacilli and the Application of this Agglutination, Koch called attention to a new tuberculin known as B.E., bacillary emulsion. It is what its name suggests, an emulsion of pulverized tubercle bacilli.

Now Koch had also called attention to the fact that if a very small quantity of tuberculin, 2/10,000 of a teaspoonful (0.001c.c.) were injected under their skin, many patients with tuberculosis would have within eight to twenty-four hours a feeling as if they had grippe, run an elevated temperature for a few hours, and show some reaction at the site of their disease. A healthy man, like himself, Koch said, would not react in this way even when ten times this dose was injected. This subcutaneous tuberculin reaction was widely used but was criticized by some observers as dangerous and many ceased to use it on this account, though in Saranac Lake we met with few if any unpleasant permanent results, and we continued its use under certain conditions. Virchow, you may recall, stated the injections of tuberculin under the skin mobilized the tubercle bacilli and thus caused a spread of the disease which we could not demonstrate on animals. Now Clemens von Pirquet, a Viennese pediatrician, found in 1907 that injection of the tuberculin into the skin produced a local reaction in the skin alone and thus removed all such objections. Later it was found that all tissues of the body reacted more or less in this way and many variations of the test were described. It is difficult to estimate how very great has been the value of these tests in diagnosis and in the anti-tuberculosis campaign. The discovery of tuberculin, the first substance used to test specific susceptibility, was a great achievement.

Recognizing that Koch's interest lay chiefly in infectious diseases, the Institute for Infectious Diseases was organized in 1891 and Koch, giving up his academic work, was placed at its head.

In 1890 Koch had bought and renovated his old home at Clausthal where he was born. In 1893 the estrangement between Koch and his wife, who some think had become a little "difficult" and more or less out of touch with his work, reached such a point that they were divorced in June after twenty-six years of married life. It is highly probable that the fault lay not entirely on one side. Rumor has it that when Koch was deeply interested in a problem he lost all idea of time and possibly of place. He would miss one or two meals a day and in deep thought would wander past his own home. When he did reach there he would greet his daughter, whom he always loved tenderly, in a distraught fashion and probably took no notice whatever of his wife and little of his food. There is little doubt that Frau Koch resented this and possibly became hysterical which in turn irked Koch who became increasingly indifferent. The marriage of his daughter and her departure from home helped to accentuate the sad state of affairs and the divorce followed.

It is rumored that the Kochs were never received socially in Berlin. In the first place he had made a grievous mistake. It was quite unforgivable for a country doctor or indeed for any physician to make the discoveries, to rise to the heights that Koch reached, when he had not gone through the usual channels and advanced through the ordinary university positions. For this reason he was always considered an outsider. In Germany it is customary for a newcomer to call upon the older men. Koch did call upon Dubois-Reymond but unfortunately he left his card at Dubois-Reymond's residence instead of at his office. Reymond returned the card to Koch, implying that he had made a faux pas and refused to recognize him socially. They order these things differently in Germany and it is difficult for us in America to grasp their importance, but it

remains that Koch was *persona non grata* in Berlin, which naturally embittered him.

Frau Koch went to live in the Clausthal house where she resided until her death in 1913 when her daughter inherited the house. Upon the walls of this house had been placed by his proud fellow citizens a tablet in honor of Koch. Two months after his divorce Koch married Fraulein E. F. Hedwig Freiburg, 29 years his junior, who had been upon the stage. The marriage was without issue, but coming so soon upon the divorce displeased the government, while some of his closest relatives refused to speak to him and the indignant citizens of Clausthal tore down the tablet. As usual Koch went silently on his way and few knew his feelings but this act may have had something to do with sending him on many foreign trips and banished from his old age some of the serenity that he so richly deserved though probably did not care for. In 1898 (March 6) we hear him: "If only time would not elapse so rapidly. How quickly the winter will be over and I will have to go wandering into the wide, wide world. First of all I will go to Rome, which seems specially created for the study of malaria."

At the British Congress on Tuberculosis, held in London in 1901, Koch called attention to the danger of attacking all pestilences alike, and recalled that leprosy, very similar to tuberculosis, was being controlled in Scandinavia by the isolation of only certain cases. An important question, whether man is at all susceptible to the bovine bacillus, is not yet and will not be for some time absolutely decided; but the danger from milk and butter and flesh of tuberculous cattle is hardly any greater than that from heredity. "I do not deem it advisable to take any measures against it," he stated. The improvement of the domestic condition of the poor will lead to a considerable diminution of the disease. He strongly advocated the erection of special hospitals for the advanced cases and even if only a fraction were thus housed it would lessen infection. Obligatory notification was, he thought, very

valuable as well as disinfection and education about infection. Sanatoria will never render these measures superfluous. In this paper Koch was hardly fair to Theobald Smith who had already shown the difference between human and bovine bacilli in 1898.

During the last fifteen years of his life Koch made many trips to foreign lands studying constantly the infectious diseases. He made trips to India where he studied the bubonic plague; to South Africa to study cattle plague; to West Africa to study tsetse fly disease and Texas fever. Malaria in its different forms, blackwater fever, also interested him, and he made contributions to all these diseases. He returned to Berlin on the 20th of May, 1898 and again on August 11th he was in Italy investigating malaria. Returning home in October he left for Java and the East Indies in the following April. On this trip he found that the children were what might be called the carriers of the malarial plasmodium. Ehrlich thinks he determined that mosquitoes transmitted malaria before Ross. He again reached Berlin in October 1900 after visiting Polynesia. His wife who had accompanied him on all these trips fell ill in New Guinea and had preceded him home.

In 1902 Koch was elected to membership in the French and Austrian Academies of Science to fill the place occupied by Virchow who had just died. Toward the end of this year he again went to South Africa, Rhodesia, to study Red Water in cattle and a form of horse sickness.

His sixtieth birthday was passed in Bulowayo, while at home forty of his students brought out in his honor a festschrift of over 700 pages, and a marble bust of Koch was designed by Joh. Pfuhl. "I was overjoyed," he wrote a friend in December (18) 1903, "to receive on my sixtieth birthday congratulations from you by wire in the distant Rhodesia. . . . I am extremely sorry I was unable to spend this day in my Fatherland but with the best will it could not be arranged otherwise. I would have had to leave my work, which is almost completed, too soon and who knows what would have become of it." On a previous trip he had

worked out a method of prevention against Rinderpest, but being ordered to India, enemies and "other dear friends" came along and condemned the work. This he will prevent now. Since 1896 Koch had made one or more trips away from home each year and now (1904) he thought it wise to resign as director of the Institute for Infectious Diseases. A new building had been erected for the Institute near what we would now call the medical center in Berlin and in it he had a room and a paid assistant. In 1904 on his retirement he was granted, after thirteen years of fruitful research, an annual pension of 10,000 marks and his close friend Georg Gaffky succeeded him. During the six years he lived, after retiring from the Institute he spent three of them abroad, fascinated with tropical infectious diseases and indulging to the full his great desire for travel which possibly he inherited from his father and never lost.

"There may be some truth," he wrote in December (13) 1904, "in what you say regarding the Nobel Prize but I believe that the poor judges are in a rather bad position because apparently it matters less to recognize actual merit in science than to see to it that the various nations all receive their share of consideration. For I could not explain to myself the choice of Prof. Pavlow (whose name I feel ashamed to say, has remained entirely unknown to me until now) in any other way." In 1905 he himself received the Nobel Prize and spoke on "How the Fight Against Tuberculosis Now Stands."

Von Behring, formerly an assistant of Koch, held that all tuberculosis came from an infection during childhood and was due to the bovine bacillus. Koch refused to accept either of these statements and when Behring patented his "bovovaccine" Koch refused to have anything further to do with him, in spite of the efforts of their mutual friends. Koch was a great man, and had strong likes and dislikes; those who sought to know him closely, to learn to understand him, were always his friends to the end.

In 1908 Koch left Berlin on his last journey, to visit his

relatives in Chicago while on a pleasure trip around the world. He was feted on his arrival in New York as you will recall. In July he reached Tokyo where he was welcomed as a prince, a temple was erected in his honor in the grounds of the Kitasato Institute, and he was almost deified. Here he received word that the Kaiser wished him to represent Germany at the Washington Congress on Tuberculosis in September. Lawrence F. Flick, the Director General of the Congress, had cabled freely to Germany and finally in this way brought pressure to bear on Koch so that he had to interrupt his trip and return to Washington where he arrived in a hot temper. At the Washington Congress Koch recalled that in London he stated that human and bovine tubercle bacilli are different, human beings may be infected with bovine bacilli but serious disease rarely develops, and that preventive measures should be directed primarily against the human bacillus. There was held a meeting in camera, presided over by Biggs, at which I was lucky enough to be present. Here Koch stoutly maintained this view and challenged anyone to show that bovine tubercle bacilli do occur in pulmonary tuberculosis. Later they were shown to occur in less than 1 per cent.

The endeavor to present to you tonight the ideas prevailing about tuberculosis at the time Koch made his memorable discovery will help you to infer what addition his work has made to our present conception of tuberculosis. He stated, you will recall, that Cohnheim had already conceived the idea that it was an infectious and contagious disease and had sketched its etiology. But few accepted such ideas until Koch brought forward the definite proof. From that time onward direct heredity of the germ has played only a minor part, for the bacillus has only in rare instances been found in the infant at birth. This Koch foresaw. All our ideas of the distribution of the bacillus in or outside the body of man or animals have been developed since the bacillus was discovered. At first it appeared as if the problem of the modes of infection had been solved by Koch when he described conveyance of the bacil-

lus by dust and intimated that droplets might play some part, a problem much worked over by his former assistant, Flügge. It must be acknowledged, however, that this problem is still far from settled if we but recall the controversy over whether pulmonary tuberculosis starts from a primary or from a secondary infection, and whether that comes from without or from within, in childhood, adolescence or adult age, by inhalation or by other portals of entry. The bacilli must often gain entrance into the blood; but still today we have great difficulty in discovering them there.

The pathology of tuberculosis was placed upon a firm basis by this discovery. Where the tubercle bacillus could be shown to be the only or predominating organism, there the pathological change must be tuberculous. The whole subject had to be reworked though much had already been done by Koch himself.

The importance of the bacillus in clinical diagnosis has already been mentioned. Koch stated that careful research never failed to disclose it in the sputum of the 29 cases of pulmonary tuberculosis which he had studied. Today we insist upon search for the bacillus in all cases but recognize also as did Koch that in some discharges, in some pus from tuberculous lesions, it is difficult if not impossible to find the bacillus when inoculation of the discharge produces tuberculosis in the animal.

The importance of the bacillus in the treatment of tuberculosis is shown in many ways. In the first place, it still remains the only absolute proof of the presence of tuberculosis. In some rather rare instances it alone makes the diagnosis of pulmonary tuberculosis positive. In these and other doubtful cases it emphasizes the importance at once of rigid treatment. We infer when tubercle bacilli are present in the sputum that ulceration into a bronchus has occurred, and per contra, when they disappear that ulceration has at least in part healed. Some insist upon the inoculation of the sputum into a guineapig, so important do they consider this point.

Probably in no branch of tuberculosis study has the discovery of the bacillus exerted so fruitful an influence as in prophylaxis of the disease. Koch stated that the bacilli in the sputum were the most important factor in the spread of tuberculosis, and later, as you know, denied the importance of milk from tuberculous cows. It is difficult to follow blindly the views of the Master in regard to milk; for, since pasteurization has been widely employed, tuberculosis in the early ages has greatly decreased. Whether this is *post hoc* or *propter hoc* is not yet definitely settled though I incline to believe that pasteurization has exerted much influence. At this time one seventh of all deaths were due to tuberculosis. In 1882, the mortality rate in cities of the United States was 326 per 100,000 living, while today in the United States it has fallen below 70. Not a direct but an indirect attack upon the disease, carefully planned, as Koch suggested, has brought this about. Cleanliness, disinfection, proper lighting, sufficient ventilation, institutional care for advanced cases (long in use in Philadelphia at the Chestnut Hill Hospital), proper methods of dusting, dispensaries, sanatoria, the proper disposal of sputum, the covering of the mouth when coughing, and a thousand and one other measures have brought the mortality from tuberculosis, in spite of war, in spite of depression, to such a figure that, thanks to Robert Koch, before many decades tuberculosis will be considered to be one more of the great infectious and contagious diseases that man has conquered.

Koch developed, as Rich says, four great trends of work in tuberculosis upon which he worked: 1. the nature of the tubercle bacillus; 2. the nature of the action of tuberculin; 3. the nature of allergy in its relation to immunity and 4. the possibility of protective vaccination against tuberculosis. None of these did he finish and still today we have the same problems.

Koch never completed his pleasure trip around the world but returned to Berlin and as usual was concerned with problems having to do with tuberculosis. His last address, given before the Academy of Science, April 17,

1910, had to do with the epidemiology of tuberculosis, in which he stressed the importance of accurate statistics of mortality, the necessity of caring for the individual patient, and proper house hygiene.

Only the inner circle of his friends and his collaborators knew his great charm for he treated even the youngest as a colleague and so advised with him. He was at his best in the conferences. He was always ready for a discussion and was very clear in his statements. He rarely found it necessary to change a manuscript. He was familiar with botany, zoology, physics, mathematics, chemistry, mineralogy, astronomy, and enjoyed ethnology, anthropology and the early history of the world, and while he liked philosophy, he had no taste for boundless speculation and mysticism. He hated congresses and "occasions." His great intelligence, his great ingenuity, his marked ability to carry his problems on to a finish, his great joy of soul in keen, close, unremitting work, his great severity in self-criticism, his great fertility of resource in overcoming apparently unsurmountable difficulties by ingenious inventions, his great perseverance and patience, his great courage in undertaking problems where the princes of science had failed, his clear understanding, his keen critical sense, his excellent memory, his tenacious endurance, his grasp of the practical application of his discoveries, his search for absolute truth, made him a great investigator, a renowned scientist, a real genius!

Simple and without pretence he cared little for all the honors emperors, kings, princes, scientific bodies heaped upon him, and he had the highest and many, many of them. But did he need them? He discovered the tubercle bacillus, the cholera germ, the germ of Egyptian ophthalmia, proved conclusively the anthrax bacillus to be the cause of anthrax, made notable contributions to the victories gained over malaria, blackwater fever, sleeping sickness, bubonic plague, discovered the cause and in some the method of prevention of many diseases among cattle and horses. Si ho ores requiris, circumspice!

"I have decided," wrote Koch to Kirchner in 1903, "that at the conclusion of my sixtieth year to retire and possibly earlier, for more than some others after my many years of strenuous work, I have deserved some rest. I believe also that my health is broken and that my pension comes not as an act of graciousness but as an act of justice!" By 1909 he had long had an irregularity of the heart but he never spared himself and was apparently hale and hearty, full of bodily and intellectual vigor. Of a serene and quiet old age he could not dream. His hair was getting lighter, his beard gray, his back slightly bent, but his carriage erect. On the evening of April 9th, 1910, following an attack of influenza but also after a day of energetic work at the Institute, he had a severe attack of angina pectoris which recurred in a milder form ten days later. Friedrich Kraus diagnosed myocarditis and gave a serious prognosis. With great exertion he visited his daughter about the middle of May and both thought it would be the last time they would see each other. Then he became a bit more cheerful, and a few days later on the 21st of May went for a change to Baden-Baden. On the 27th, at the suggestion of his wife, he dressed and while sitting on the balcony, facing a glorious sunset, fitting for the departure of such a spirit, his chin dropped upon his chest and gently without a struggle he fell into the last long sleep that awaits us all, spared the sad consciousness of prolonged bodily and intellectual decay. In silence, in the presence of his wife, his daughter, and one or two intimate friends his body was cremated, and his ashes now rest in a niche behind a marble tablet in the Robert Koch Institute for Infectious Diseases, from whence forever his great work goes forth to serve and to save mankind.

The material for this paper has been drawn in part from the following sources:

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Personal Communications from Prof. William H. Welch.

The data concerning Biggs has come largely from Winslow's Life of Biggs and the author's personal recollections.



FIFTH ANNUAL GRADUATE FORTNIGHT
OF
THE NEW YORK ACADEMY OF MEDICINE

OCTOBER 17 TO 28, 1932

A postgraduate two weeks devoted to Neoplastic Diseases

THE PROGRAM COMPRISES

Specially Arranged Afternoon Clinics

bearing upon the general subject of the Fortnight to be presented in eighteen of the large hospitals of the city;

Evening Sessions

at which well-known authorities will discuss the general subject from many viewpoints;

A Scientific Exhibit

of anatomical and pathological specimens and research material.

EVENING SESSIONS AT THE ACADEMY
8:30 o'clock

FIRST WEEK

¹Monday Evening, October 17

1. Opening remarks

John A. Hartwell, President, The New York Academy of Medicine
George Gray Ward, Chairman, Committee on Graduate Fortnight

2. Tumors of the brain

Charles A. Elsberg, Professor of Neurological Surgery, Columbia University

3. Tumors affecting the optic chiasm and optic tract

Joseph H. Globus, Associate Neurologist, Mount Sinai Hospital

4. Tumors of the eye and optic nerve

W. Gordon M. Byers, Professor of Ophthalmology, McGill University

¹Program arranged by courtesy of the Section of Ophthalmology.

²Tuesday Evening, October 18

Tumors of the lung, pleura and mediastinum:

1. Medical aspects

James Alexander Miller, Professor of Clinical Medicine, Columbia University

2. Surgical aspects

George J. Heuer, Professor of Surgery, Cornell University

³Wednesday Evening, October 19

1. Diagnosis and management of bladder tumors

Edwin Beer, Surgeon, Mount Sinai Hospital

2. A consideration of the malignant prostate and associated obstructive manifestations.

Joseph F. McCarthy, Director, Department of Urology, Post-Graduate Medical School

Thursday Evening, October 20

1. The historical development of the pathology and therapy of cancer

Henry E. Sigerist, Director, Johns Hopkins University, Institute of the History of Medicine

2. THE WESLEY M. CARPENTER LECTURE: Cancer research

Francis Carter Wood, Director, Cancer Research, Columbia University

⁴Friday Evening, October 21

1. Tumors of the spinal cord

Byron Stookey, Associate Professor of Neurological Surgery, Columbia University

2. Tumors of the nerves

Dean Lewis, Professor of Surgery, Johns Hopkins University

SECOND WEEK

Monday Evening, October 24

Program arranged under the auspices of The Medical Society of the County of New York

1. Importance of statistics in cancer control

Louis I. Dublin, Third Vice-President and Statistician, Metropolitan Life Insurance Company

2. The factors constituting malignancy in tumors

James Ewing, Director, Memorial Hospital

²Program arranged by courtesy of the Section of Medicine.

³Program arranged by courtesy of the Section of Genito-Urinary Surgery.

⁴Program arranged by courtesy of the Section of Orthopedic Surgery.

3. Summary of radiologic treatment of tumors with special reference to malignant diseases

Geo. Edward Pfahler, Professor of Radiology, Graduate Medical School, University of Pennsylvania

⁵Tuesday Evening, October 25

1. Tumors complicating pregnancy
Benjamin P. Watson, Professor of Obstetrics and Gynecology, Columbia University
2. Myomata and adenomyomata of the uterus
Thomas S. Cullen, Professor of Gynecology, Johns Hopkins University
3. The treatment of cancer of the uterus
George Gray Ward, Chief Surgeon, Woman's Hospital

Wednesday Evening, October 26

1. Tumors of the mouth and tongue
Carl Eggers, Surgeon, Lenox Hill Hospital
2. Tumors of the stomach
Donald C. Balfour, Mayo Clinic
3. Tumors of the colon and rectum
Daniel F. Jones, Associate in Surgery, Harvard Medical School

Thursday Evening, October 27

1. THE BULKLEY LECTURE: Consecutive pathological and clinical events in cancer
Harrison S. Martland, Pathologist, Newark City Hospital
Tumors of the bones and allied structures:
2. Surgical aspects
James M. Hitzrot, Attending Surgeon, New York Hospital
3. Radiological aspects
R. E. Herendeen, Roentgenologist, Memorial Hospital

⁶Friday Evening, October 28

1. Cholesteatoma
Samuel J. Kopetzky, Professor of Otology, Polyclinic Medical School
2. Tumors of the skin and mucous membranes
A. Benson Cannon, Associate Professor of Dermatology, Columbia University
3. Hodgkin's Disease
Lloyd F. Craver, Physician, Memorial Hospital

⁵Program arranged by courtesy of the Section of Obstetrics and Gynecology.

⁶Program arranged by courtesy of the Section of Otolaryngology.

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EDITORIAL

MEDICAL GEOGRAPHY AND GEOGRAPHIC MEDICINE¹

"Die Geomedizin muss erst geboren werden"

Heinz Zeiss.

Silly Billy, confronted by the Siamese Twins, put the pyramidal query: "Brothers, I suppose?" But the distinction between medical geography and geographic medicine (geomedicine) is something more than a distinction without a difference. With regard to the unattainable ideal of world-control of disease, it opens up lines of thought which may be of considerable moment for the medicine and sanitation of the future. Medical geography deals with the relation of climate and environment to disease and its distribution in space within any given period of time. The aim of geomedicine would be to map out not only the distribution and peculiarities of disease, but also the status of medicine and sanitation over given areas of space, within the same time-interval. In like manner, medical history accounts for the progression of medicine over different areas in space through successive periods of time; historical medicine for phases of this development within any definitive space-area and time-interval. Medical geography is, therefore, that phase of political geography which accounts for the diseases of different countries or regions of the earth and their peculiarities, as influenced by such local conditions as soil, water-supply, climate,

¹Read, in part, to the historical group of the Medical School, Yale University, New Haven, on June 21, 1932.

meteorology, flora, fauna, entomology, ethnology and so on. Geomedicine implies the cartography or topography of disease and of the temporal status of medicine and sanitation within the same global areas. It had no existence in the past and its whole concern is with the possibility of a concerted, world-wide organization of medicine in the future. For historical purposes, therefore, geomedicine is the science of the distribution of medicine in space, supplementing medical history, the record of the progression of medicine in time. Medical history is a lineal, geomedicine what Henry James once termed a "lateral demonstration."²

Medical geography began with its basic text, the *Airs, Waters and Places* of Hippocrates, which is incidentally the first important excursus into anthropology, ethnography and climatology. At the very beginning of this tract, Hippocrates urges physicians entering an unknown locality to inquire into its climate, water-supply, prevailing winds, seasons, and native population, with reference to current diseases and their seasonal impact. As he develops his theme, he discusses in succession the diseases of Thessaly and Thrace, the ethnic peculiarities of Egyptians, Persians and Scythians and the effects of climate and environment upon the political and military spirit of liberty-loving Europeans and the subjects of the Oriental despotisms. The handling of the material is scientific throughout, the basic theme is further expanded in the treatise on Epidemic Diseases and the two tracts have long since taken their place among the major classics of medical literature, with few competitors in sight for great stretches of time. Apart from the stray observations of travellers, medical geography was destined to be merged into epidemiology for many centuries, with nothing to its credit comparable with the descriptions of the plague of Athens by Thucydides and Lucretius or the observations

²The expression was employed by the novelist to describe the abrupt transition of a large-sized lady from one seat in a drawing room to another, or, shall we say, the attempted ingress of a broad girl through a narrow doorway.

of Baillou and Sydenham. The first formal contribution to medical geography was, in fact, the three-volume treatise of Leonhard Ludwig Finke (1792-95), which is a good example of the pragmatic method of the 18th Century systematists. Finke blocks out the scope, aims and methods of medical geography with Germanic thoroughness and has even some notion of the effect of environment upon the development of medicine; but in the assemblage of data for the execution of his effective plan, he has naturally very little to go upon. Apart from such rare estrays as Lionel Chalmers on the diseases of South Carolina (1788) or Cleghorn on the diseases of Minorca (1809), there was nothing else of consequence up to the middle of the 19th Century, when Daniel Drake's two volumes on the Diseases of the Interior Valley of North America (1850-54) made a mile-stone of progress. This work is in the great Hippocratic tradition, and was, in its time, the most important contribution to medical geography after Airs, Waters and Places. In assembling his data, which cover the climate, meteorology, botany, zoology, ethnography and prevailing diseases of this vast area, Drake followed the peripatetic plan, travelling all over the Mississippi Valley at his own expense. His work was easily the most important American contribution to medicine in its period, next to the introduction of ether anæsthesia (1847), and was so regarded by Hirsch, Billings, Stillé and Osler, who planned to deliver a "Mississippi Valley oration" on the significance of Drake. The disease-areas which Drake triangulated are now among the healthiest in the world; the anomalous communicable fevers he described have disappeared. When we consider how much the early settlement of the Middle West was impeded by the transmission of these diseases, the relation of their disappearance to contemporary advance in sanitation is of the very essence of geomedicine.

With the appearance of the great three-volume treatise of August Hirsch (1817-94), medical geography came into its own. This work covers the distribution of diseases

all over the world in a most exhaustive way for the time in which it was written, and represents years of patient labor, not duplicated in any of the subsequent treatises on geographical pathology by Clemow, Davidson and others. Even at this time of day, it is still a standard source of reference, set off by such intensive studies of the geographical distribution of particular diseases as those of Laveran on paludism and trypanosomiasis, Zambaco Pasha on leprosy, Loeffler on diphtheria, the Rockefeller survey of hookworm infection or Sticker on plague, cholera, influenza and dengue. An anecdote, perhaps *ben trovato*, will illustrate the method and application of Hirsch. It appears that the old fellow was fond of relaxing with his boon companions around the *Stammtisch*, indeed, like Shenstone's traveller, was fain to "find his warmest welcome at an inn." At stated intervals, his wife would appear to prompt him, with uplifted forefinger: *August, mein August, du hast deine zwei Stunden noch nicht gearbeitet!*

It is in the nature of things that most of the data of medical geography should be static, applicable mainly to the period of time in which they were made. Two interesting contributions to the dynamic phase of geomedicine, dealing with the mobilization of disease over definite areas and within definite periods of time, are the studies of Dr. W. H. Gantt on the changes in impact and distribution of disease in Russia following the Revolution and famine, and of Col. Percy M. Ashburn on the effect of disease on the settlement of the North American Continent.

Gantt found that the social upheavals and economic misery of 1917-22 produced a complete *bouleversement* of ordinary pathological conditions in Russia, so that gout, diabetes, obesity and other digestive or metabolic disorders due to repletion disappeared, while hunger-œdema, cachexia, scurvy, typhous fever, gastro-intestinal irritation, polyneuritis and other disorders associated with starvation or vitamin-deficiency appeared in full force. At the same time, malarial fever was carried all over Russia, from the Arctic Ocean to the Crimea, by the mosquito; cholera, influenza, typhus, smallpox and other communicable diseases swept the great plain with the devastating impact of mediæval epidemics, and while venery and venereal diseases increased apace among the ~~th~~ ^{ing}red, starvation merged into cannibalism and

inanition produced the impotence predictable in Claude Bernard's theorem that generation and sex are consequent upon nutrition.

Ashburn finds that the New World was regarded as a Paradise by the old travellers for the reason that the diseases, vices, warfare, and oppression subsequently imported were non-existent in the earlier period of exploration, while most of the diseases which impeded the settlement and development of the continent were brought in by the settlers themselves. Malarial fever, endemic in Spain, was brought into Mexico, Peru and the Antilles by the Spaniards and subsequently by the slave-trade. Smallpox, yellow fever, leprosy, hookworm and other parasitic infections, and probably trachoma, were also brought in by the African negro, who was immune to malarial and yellow fevers. Cerebrospinal meningitis (*modorra*), rampant on the coast of the Bay of Biscay as early as 1409 (Sticker), was probably brought in by the Spaniards. Syphilis, in the findings of Sudhoff, was existent in Europe long before the discovery of America and acquired a superadded virulence when introduced among the Indians and Aztecs. The fact that prehistoric trephining was often repeated, as also the clean healing of wounds in pioneer surgery (McDowell's ovariectomies), suggest that even the pathogens of wound-infection were imported. The diminution or disappearance of the Indian before the advancing white was due in the first instance to imported diseases and later to the warfare made upon him by the settlers. In this extermination, famine, scurvy and starvation also played a part. The Indian, invested with an ideal halo by Rousseau, Pope, Chateaubriand and other sentimental theorists of the *Aufklärung*, was hated at close range, as the native is always hated by the immigrant. The delectable Edens of the earlier travellers became hotbeds of malaria, as Ramon y Cajal found to his disillusionment while on military duty in Cuba. Guayaquil, described by Monardes as a health-resort in 16th Century Peru, became a pest-port later and is now again safe and sanitary. Ashburn's findings illustrate the various factors and coefficients entering into the convection and mobilization of communicable diseases and how their ultimate extermination in a given area is a function of the geomedical status of that area.

Geomedicine, vaguely adumbrated by Finke in the 18th Century, was first clearly outlined as to scope and aims by Philipp Ludwig Wittwer in his *Archiv für Geschichte der Arzneykunde* (1790), the first periodical devoted exclusively to the history of medicine. In the prospectus of his new journal, Wittwer specifies among the material requested by him for publication, reports of travellers upon the status of medicine among primitive peoples and data upon the effect of climate, mode of government, religion, immigration, wars and conquests, degree and extent of culture upon the status of medicine in all times and places. Here, for the first time, the historic phase of geomedicine is

broadly and clearly defined without realizing it and it is plain that the data for the non-existent science must be assembled from the reports of travellers or itinerant physicians. To the old travellers we therefore turn, to find the beginnings of geomedicine in the narrative of Hippocrates' contemporary, Herodotus. Formerly ridiculed as a credulous romancer of "travellers' tales," Herodotus gives us the veritable status of Egyptian, Assyro-Babylonian and Persian medicine in the 5th Century B.C. and his findings have been borne out by the subsequent researches of archæologists, philologists and medical historians. It is an aeroplane view, intercepted (mark this) within a definite time-interval.

The extreme specialization which Herodotus found in the Egyptian medicine of his time (a doctor for every disease or class of diseases) points to the same decadence which we find in the Egyptian art of the New Kingdom. We reason backwards to the Smith Papyrus (Old Kingdom) as we do to the great period of Egyptian sculpture. The surgery of the Smith Papyrus is not so good as that of 4th Century India, inferentially of 5th Century Greece, but is scientific in method and better than that of the Ebers Papyrus. The medicine Herodotus outlines is not even that of the Ebers Papyrus, but of a more decadent period. The communal medicine of Babylon, as Herodotus found it (the whole people as physician), seems decadent, in the light of Virchow's dictum that when medicine becomes absorbed into the general fund of common knowledge, it ceases to be medicine. But doctor and pharmacist are still to be found practising on the street in Persia, North Africa and other Mohammedan areas, where, at the same time, the indoor patient is besieged by swarms of importunate visitors, suggesting lines of treatment. The exposure of the patient to voluntary suggestions of visitors or passers-by, would seem to be some remote phase of Oriental custom. Persian medicine, as Herodotus found and described it, was apparently in a phase of emergent evolution. In the 5th Century B.C., the practices of an essentially nomadic people were merging into those of the agricultural or stationary stage of civilization, when the folk-superstitions codified in the Zendavesta—the sanctity of earth, fire, water, dog and hedgehog, the ritual purification by sprinkling with cattle urine at a respectful distance from fire, water and fertile earth, the exposure of corpses to be devoured by vultures on Towers of Silence—were about to be discarded for something more rational. In Herodotus, we find that the corpse could be buried after only slight laceration by dogs or vultures and that Cyrus had water boiled in brass kettles on the march, for drinking purposes. In other words, earth and water were no longer to be regarded as pure and sacrosanct. With the Arabic conquest, the Persians adopted the religious cult and medical practices of Islam. Adherents of the ancient

faith (Parsees) were confined to the oasis of Yezd or flocked in force to their present stronghold in Bombay, and Persian medicine remained as Herodotus found it, in the gerundive state of being about to be.

It is a commonplace of observation that medicine and medical men are seldom, if ever, mentioned by secular historians, although the impact of disease has not seldom been the determining factor in the success of military enterprises up to the World War and has sometimes had more to do with the decay of empires and the fall of statesmen than the casual dropping of a handkerchief, or "some frail beauty's smile." Livy is explicit as to the demoralizing effect of communicable disease upon troops and of the presence of wounded on the battlefield upon the issue of a battle. Froude, at the beginning of his *History of England*, ascribes the almost stationary condition of the population of Great Britain for many centuries to the effects of "Devouring Famine, Plague and War." Wells mentions only Avicenna. When we consider the meagre amount of information about medicine and doctors to be gleaned from the secular historians and writers of memoirs, the wealth of material on geomedicine in the writings of old travellers, from Herodotus down, seems truly remarkable. In the large collection of old travels purchased by Dr. Welch for his Institute, there is hardly a volume which does not contain some effective sidelights or valuable information on the status of medicine in the various countries concerned.

As an example, let us take Hans Staden's account of his captivity among certain cannibal Indians of Brazil in 1547.

These cannibals were about to eat him, when a howling was set up in the huts and he subsequently learned that many of his captors had fallen ill. Believing that Hans Staden's God was angry with them, they implored him to intercede with this God that they might be restored to health. Playing upon this primitive view of disease as a punishment inflicted by a vengeful deity, Hans Staden replied that his God was indeed angry with them for threatening to eat him and, having obtained the king's promise that if he recovered his health, he would not permit his captive to be eaten, he was able, through this superior magic, to temporize and eventually effect his escape. Hans Staden gives other details about the medicine of the Tupi Indians, but we need no further information than the above to estimate

its status in the year 1547, nor is it likely that it ever emerged from this lower level.

In his account of the Barbary States (1738), Thomas Shaw devotes a special chapter to the kind of Moslem medicine practised by the Berbers at the time of his visit (1727).

Decoctions of native herbs or minerals, on the old theory that bane and antidote, disease and remedy flourish side by side in nature; the inevitable charms and spells; routine use of the *hammam* or warm bath; ignipuncture with the red-hot iron in pleurisy and rheumatism; the use of butter, kermes mineral in honey, alcohol or powdered lead to prevent pitting in smallpox; pouring boiling water into open wounds; the use of hot, roasted prickly pear leaves as a dressing for wounds, bruises, boils, abscesses and the sores of bubonic plague; cataplasms of moistened henna powder for slight wounds; and the application of the hot roasted root of the *Thapsia* plant in sciatica, were among the staple remedies employed. Clysters were virtually unknown; indeed Shaw records that a Turkish gentleman afflicted with violent headache was moved to reject intestinal irrigation at the hands of an English physician on the ground that "so noble a part of the body as the head could not be influenced or corrected by applications made at so distant and ignoble a region as the tail." The Oriental trait of "buying the smallpox," i.e., of rubbing a small incision in the hand with scabs from mild cases, purchased in the open market, was the usual mode of preventive inoculation; but in view of such grave accidental sequelæ as losing the eyes, the practice came to be regarded as tempting Providence and to risk an actual attack of the disease was preferred by most.

Here we have a fairly complete picture of the status of Moslem medical practice in the first half of the 18th Century, with therapeutic features far from contemptible. These phases of half-primitive or semi-civilized medicine may be contrasted with Hilton-Simpson's findings in Algeria in 1912. In this interval of two centuries, Mohammedan practice of medicine and surgery over the same area had improved not a little, largely due to the use of mediæval Arabic text-books of medicine and ophthalmology still printed in Cairo, and better than nothing, albeit, as with all aspects of Moslem medicine in modern life, a distinct phase of marking time in the past.

In like manner, the accounts of the diseases and medicine of the Aztecs, as conveyed in the various histories of the conquest of Mexico by Cortez, deserve study, in connection with the Maya codices, as data of the comparatively un-

explored field of Maya and Aztec medicine. The songs of the medicine man, printed by the civilized North American Indian, John Tanner, in his account of his captivity (1830), including songs for the seeking, finding and administration of vegetable and mineral remedies, summarize everything essential in Indian therapy or other phases of "making medicine." But on the whole, the best formal scientific accounts of the primitive medicine of strange regions and outlandish peoples are to be found in the journals devoted to anthropology and ethnology. Of these, the reports of the Roman Catholic missionary priests in the journal *Anthropos* (Salzburg, 1906-32), are most highly esteemed, as being based upon intimate knowledge of native traits and modes of thought, lengthy experience, careful observation and patient assemblage of facts, sufficient, at least, to set off the difficulties everywhere encountered by the civilized mind in attempting to visualize and interpret the workings of the savage mind. The facts, in any case, speak for themselves, whatever interpretation may be read into them, and under the newer dispensation of anthropology, the findings of folk-medicine are found to converge to a certain lowest common denominator, namely, disease as an effect of supernatural agencies, with charms and spells, plant-lore and psychotherapy as remedial devices. To the savage, and even to the semi-civilized, the natural is the supernatural, or as Sir William Gull put it: "Savages explain; science investigates."

Perhaps the most accomplished and best equipped of professional travellers and explorers was Sir Richard Burton, whose writings abound with valuable data on geo-medicine. At Oxford, Burton lived in the house of the celebrated medical scholar, William Alexander Greenhill, who started him on the study of Arabic. As a young officer in the Bombay native infantry, Burton incurred ridicule and obloquy among his brother officers by his propensity for learning all he could about the native dialects, religious beliefs and customs of the Indian peninsula. Later on, as Kipling observed, knowledge of the vernacular became

essential in the military service and the examinations for admission to the Indian Civil Service imply such profound and extensive knowledge of native languages, laws, literature, religious and ethnic traits that no human being could pass more than a fraction of the questions asked. In his translation of the Arabian Nights, his Pilgrimage to Mecca and Medina, his many volumes of African, Asiatic and South American travels, Burton did not consciously follow up medicine as a theme for investigation, nor do we find any special notation of his innumerable observations on primitive medicine in the indexes to his books. Even the invaluable data on Moslem medicine in the footnotes to his Arabian Nights have to be dug out of these volumes, bit by bit, but these data are the findings of one of the keenest, most wide-awake observers who ever lived and one can conceive of no more rewarding line of investigation for a student of geomedicine than to assemble them from the vast *corpus* of his literary output. So too, a study of the medical data in the volumes of travel assembled by Dr. Welch would be in the nature of prolegomena toward a topography of the present condition of medicine, surgery and sanitation all over the habitable globe. Here, the elder travellers were only precursors, it is true, but, even so, the medical historian has more to learn from them than from any of the secular historians.

As an experiment in the possibility of assembling geo-medical data from remote or unconsidered areas in the actual world we are living in today, one or two fishing lines of inquiry have elicited astonishingly prompt and sympathetic responses. Dr. Matas, with the genial kindness which has made him so much beloved in our profession, has indicated most effective ways and means of triangulating the present status of medicine in Latin America. Dr. Cyril Elgood, late physician to the British Legation at Teheran, has forwarded a very understandable survey of the present conditions in Persia, where the mediæval medicine of Islam and modern European medicine compete side by side. Dr. James H. Sequeira, President of the

Kenya Branch of the British Medical Association in 1930, sends the following notes on medical conditions in his colony which are of particular interest, in that here primitive African medicine coexists with the kind of medical practice which is going on in prosperous English towns, such as Leeds or Manchester or Birmingham :

The Kenya Colony and Protectorate comprises about twice the area of Great Britain and Ireland, covering 224,960 square miles. It has every variety of climate, from the steamy, sticky heat of the tropical coast and lakeside regions to the cold of 7000-8000 feet above sea-level. The English population live mainly on a high table-land, with a climate as bracing as that of Britain and are thus in position to duplicate home conditions without difficulty. The African population, about 40 different tribes, numbers $2\frac{3}{4}$ millions, mainly Bantus, Jalu and the virile, warlike Masia (40 millions). The Asiatics, mainly Indians, number about 37,000 and the Europeans 15,000, of whom 5000 reside in Nairobi and 1000 in Mombasa. The population of the Coast and of Mombasa Island is mainly Suahili, a mixture of Arab and Bantu. There are 2280 European and 3365 native officials. As at army posts, free medical attendance is afforded to officials and their families by government doctors, but private practitioners may be consulted on occasion at personal expense. For non-official Europeans there are, in Nairobi, ten general practitioners, a medical and a surgical consultant, an alienist, an ophthalmologist, several European dentists and X-ray operators; and Dr. Sequeira himself carries on in Nairobi his brilliant London Hospital record in dermatology. In the country districts of sufficient European population, there are general practitioners, who, Sequeira says, "act exactly as general practitioners in England and send their difficult cases into Nairobi for general treatment." Nairobi has two excellent nursing homes, where European women are usually attended in pregnancy and confinement; two or three townships have their own hospitals, supported by local rate-paying or private contributions; and there are also extensive hospitals for the African population at Nairobi, Mombasa and Kisumu, in which Asiatics may also be treated in special wards, when not financially able to consult the Indian, Goan and European practitioners. There is also a hospital for insane natives. All the hospitals are staffed by government physicians, European trained nurses, native orderlies, and female assistants. Out-patient departments are provided by government and there are ante-natal clinics, infant welfare units and venereal dispensaries at Nairobi, Mombasa and other centers. School inspection in the towns is forwarded by volunteer government doctors. But all these measures meet the needs of only a small fraction of the native population, distributed over the Native Reserves and on European farms. The European farmer is required by law to house, feed, find and furnish medical attention to his laborers and their families, and often renders first-aid and routine treatment himself. Serious cases are motored to the nearest hospital, at which

the employer pays a subsistence charge to government. Employers of labor on a large scale have their own hospital and dispensary arrangements, supervised by a local practitioner or by a government official with native dressers. In the Native Reserves, there are hospitals with two medical officers, one of whom is usually on tour, visiting regularly the dispensaries. These are constructed by the Native Councils at 20 miles radius from the hospital and manned by native dressers, educated at the Mission schools and trained in the government hospitals. As the European doctors command only the Ki-Suahili dialect, these native dressers are of great use as interpreters of the many local tongues and are often trained microscopists. On *safari*, Dr. Sequeira found them demonstrating the ova of the hookworm or bilharzia, stained specimens of the tubercle bacilli and the trypanosomes from a lymphatic gland in a case of sleeping sickness. Others he found to be expert in the intramuscular injection of bismuth, under strictly aseptic conditions, in the jaws areas, where routine treatment is as extensive and systematic as at Paranaque and other jaws centers in the Philippines. The incidence of syphilis is very variable in the different tribes, and there is a kind of group immunity, "not absolute but relative," in the jaws areas and in tribes in which malarial infection is well-nigh universal. Venereal infection has increased apace with native migration to the towns. Infant mortality, due largely to maternal ignorance and improper feeding, is enormously high, as much as 400 per 1000 births in some areas. There is very little evidence of congenital syphilis as a factor, but here again, nearly every infant in certain areas is afflicted with jaws or malarial fever. Impetigo and intestinal worms are common. Native midwives are pitifully incompetent and the scar tissue from female circumcision (clitoridectomy) is often a serious obstruction to normal labor, with *exilis lethalis* from the bungling episiotomies of sable Sairey Camps. Dr. Sequeira found a native woman who had been in labor for a week and many moribund cases are motored into hospital. Much good pioneer work is done by the medical missions and mission doctors and the work of the Public Health Department of Kenya is along very advanced lines, covering education of the natives in personal and public hygiene by the printed and spoken word, mass meetings to demonstrate the dangers of parasitic infection, hookworm and sleeping sickness campaigns, moving pictures and district exhibits of hospital cleanliness, use of pit latrines, model houses, etc. In one hookworm area, 50,000 native patients were treated and 7000 pit latrines were dug. At the public health shows, the native dressers, many of them born actors, are eminently successful in interesting the people, so much so in fact, that the headmen of villages have been found to be provided with mosquito netting, gauze-screening against flies and crude rat-proofing. In extent and variety of accomplishment, the Medical Research Laboratory at Nairobi will compare favorably with the Wellcome Laboratories at Khartoum, and is designed to be the centric unit of a hospital system for Europeans, Asiatics and Africans. The range of its accomplishment extends from routine blood examinations for parasites up to regional studies

of mosquitoes and research into the cyto-architecture of the African frontal cortex. The main difficulties encountered in the advancement of medicine in Kenya have been the opposition of the witch-doctors and native firebrands in certain tribes, which has made the work of the government medical official risky and dangerous at times; the effect of tropical rains and deluges on even the best roads and bridges and the general difficulties of transportation. "In some areas," says Sequeira, "we still have the doctor's *safari*, consisting of a lengthy train of boys carrying their impedimenta on their heads." The *Kenya Medical Journal*, red-covered, slender, but substantial in content, is creditable to the enterprise of the infant colony.

Here, then, in the very heart of Africa, we have one of the most successful of British experiments in colonial administration, in which a handful of English physicians have been able to develop English medicine according to English ideas, and, at the same time, indulge the Anglo-Saxon's known propensity for bettering his neighbor. The success of the experiment is probably bound up with the shrewd observation of Froude that the negro is perhaps the only *primitif* who is capable of adapting himself to the ways of the white, or more accurately perhaps, to the ideas and sentiments of the Anglo-Saxon, as a survival-value. Ordinary experience, as the French anthropologist observed, is just the other way around, viz., the immigrant or invader adopts the current ideas and superficial traits, but never the sentiments of the native-born population. Contrast Kenya medicine, for instance, with that of India, in which the Unani and Ayurvedic systems flourish alongside of English medicine; or with that of the Philippines, in which American, Spanish, Chinese and primitive Malay medicine coexist; or with the following, from an esteemed correspondent in Peiping, China:

Modern medicine in Peiping is a distinctly exotic thing, centering around the wonderful organization of the Peiping Union Medical College, built and sustained by Mr. Rockefeller. There are also four or five other medical schools of lower standard, which turn out useful men for general practice, but general medical practice in China is largely in the hands of old style practitioners, who have set up in practice after the most rudimentary training of the old apprentice type. There has never been such a thing as a national medical school or college of Chinese medicine, but training, from time immemorial, has been acquired from medical guilds, like those of ancient Greece. These are very strong and sustained by popular sentiment, which is violently opposed to autopsies, toxicology and laboratory procedure.

Chinese internal medicine, midwifery and sanitation are consequently semi-primitive in character, as in the Dark Ages of Europe. When President Sun Yat Sen lay dying in a hospital from cancer of the liver, he was taken away by native practitioners, who gave him the old potions for quieting the "fire" in the liver and strengthening the *pneuma*. In 1929, Mr. Tan Yen-Kai, the head of the government, sustained an attack of apoplexy, but even the opinion of the Minister of Health was overruled in favor of the worthless remedies of the old school practitioners. The Board of Health, established in the Nanking Government by the Young China Party (1928), has now been demoted to the status of a subsidiary bureau in the Board of the Interior. The 600-700 Chinese physicians who form the National Medical Association, were nearly all of them trained in England or America and flourish in the Treaty Ports. In the interior, modern medical practice is carried on, usually by American physicians, with the utmost precaution and *savoir faire*. There is also the Japanese group, several thousand in number, trained in Japan from German text-books, who care for the Army, Navy and political posts. The International Health Board cooperates with the Board of Health in attempting to float a program for improving sanitation and obstetrics in Peiping, Nanking, Shanghai and Canton. The Manchurian Plague Service, the China Medical Missionary Society and the *China Medical Journal* have all of them, a record of good work and the future outlook is not bad, since the old Chinese practitioners have little organization and build no schools.

These few examples may serve to adumbrate the future importance of geomedicine, in connection with modern facilities for transportation by air and communication by radio. Apart from the dry statistical data available in Blue Books, how many sanitarians, for instance, could visualize offhand the real inwardness of present-day medicine and hygiene in Afghanistan, Bolivia, Borneo, Celebes, North Australia, Siberia, Sierra Leone or Bulawayo in Mashonaland? The first after Wittwer to sense the importance of the subject and to call attention to it was Professor Heinz Zeiss,³ of the Institute of History of Medi-

³See H. Zeiss: *München med. Wochenschr.*, 1931, LXXVII, 198-201; and *Ztschr. f. Geopolitik*; Berlin, 1932, IX, 474-484. Zeiss defines medical geography as that branch of geography which treats of the effect of environment upon the people, animals and plants within a given area; geomedicine as that branch of medicine which investigates medical conditions by the geographic or cartographic method. This provisional definition is obviously dictated by the immense scope of geomedicine. Zeiss's studies center mainly on the medical topography of the Soviet dominion and border-line conditions on the Polish Corridor.

cine in Berlin, whose long residence in Russia under the Soviet régime no doubt impressed him with the necessity of triangulation, similar to Daniel Drake's survey of the Mississippi Valley, if the vast Asiatic plain controlled by the Soviet government is to be made habitable for civilized man. It is even possible that the outstanding achievement of the Soviet organization will be the civilizing of the semi-barbarous peoples of this great plain, where even a moderate increase in creature comforts implies a definite upward trend, contrasting sharply with the somewhat amateurish efforts made to render the populations of Moscow and Leningrad comfortable. Evidence to this effect is already available in such records as Jan Welzl's "Thirty Years in the Golden North" (New York, 1932), the terminal chapter of which describes the crude medicine and surgery which has to be improvised to meet the emergencies of this arctic immensity of desolation. Certainly geomedicine, albeit of Germanic origin, is one of the best things which has come out of the Five Year Plan and the Asiatic dominions of the Soviet would seem to be the most promising field for its immediate practical application.

Geomedicine, or the triangulation of medicine in space, holds out many promising possibilities for future investigation. One of these was thrown into relief at the International Congress of Tropical Medicine at Singapore in 1923. The sense of this Congress was to the effect that each tropical area of consequence has its own peculiar climate, flora, fauna, insects and diseases, whence the medicine or sanitation applicable to each area is *sui generis*. The medical geography, and consequently the geomedicine of Northern Australia, India, the Latin American States, the Philippines, Malaysia, Melanesia and Polynesia are by no means reducible to the pattern implicit in text-books on tropical medicine. Each of these areas has, in fact, its own peculiar type of tropical medicine⁴. Again, enlarging

⁴This phase of geomedicine has even wider implications and applications. Allbutt found that the elegant therapeutic prescriptions introduced by Trousseau at the Hôtel Dieu had no particular effect upon his sturdy

upon Hirsch's original concept of geographical pathology as the effect of climate and environment upon the physiological and pathological status of man, Askenazy has organized an International Society of Geographical Pathology (1928), which aims to coordinate the comparative aspects of disease in different countries, regions and peoples all over the globe. Another promising field is suggested by the immense interest attaching to family-trees and the records of families in present day Germany, where societies for *Familienforschung* are springing up everywhere. The scope of this important line of inquiry is immense, ranging from data in Burke's Peerage, the Almanach de Gotha or Galton's album of talented families to the records of the Jukes, Nams and Kalikaks. Closely related to this important line of inquiry is the distribution of the protean semeiology of a major disease in space, in other words, among the members and collateral sibs of a given family. Apart from the devastating effects of plague, cholera, yellow fever, cancer, and pneumonia as killers, or of syphilis, tuberculosis and malarial fever as poisoners of the human stock, the manifestations of such diseases as gout, rheumatism, neurosyphilis or influenza are polymorphic, of lateral, as well as linear and lineal distribution, so that a complete picture of the disease might be assembled as a summation of its fragmentary manifestations in the members of a given family. The best work in this field to date was done by Sir Clifford Allbutt, who, during his twenty-eight years of medical practice in Leeds, became the county consultant or family doctor of all Yorkshire. He got to know the medical histories of the different county families so well that few Yorkshiremen of consequence failed to con-

Yorkshire patients at Leeds. Stroganoff, applying his expectant treatment of eclampsia to Bumm's obstetric wards in Berlin, could not get the dazzling percentage of success afforded by his Slavic patients. Zeiss notes that the English sweating sickness of 1506-51 did not penetrate the Latin countries or the Slavic north, and notes that the metabolism and disease-reactions of East Prussians are different from those of the Rhineland and the Ruhr, that climatic and meteorologic conditions have remarkable effects upon respiratory diseases and surgical operations in the tropics and the far North, and so on.

sult him during a grave or terminal illness. Twenty years before Charcot, Allbutt saw the protean manifestations of the gouty, rheumatic and neuro-syphilitic diatheses as distributed laterally (in space) as well as lineally (in time), usually pivoting around such cutaneous manifestations as erythema and purpura. Here, an independent disease in an individual may be correlated in space as a mere symptom of a diathesis of wide familial distribution.

Thus, in Allbutt's gouty series, dyspepsia, the arthritides, phlebitis, nephritis, arteritis, angina pectoris, migraine, hypochondria, insanity, neuritis, glycosuria, bronchitis, hæmorrhoids, hæmophilia, and eczema may be distributed among the ascendants, descendants and collateral sibs of a familial stock. In his neurotic series, insanity, chorea, hysteria, migraine, angina pectoris, gastralgia, asthma and catarrh may pivot in the same way around eczema and pruritus.

Allbutt's studies, continued by Osler, Libman and others, tend to confirm the subsequent observation of Charcot that the gouty-rheumatic and neuro-syphilitic diatheses are like two trees, the roots of which are so inextricably intertwined that above ground they seem to be one tree. How else explain the successful treatment of arthritis deformans by operative resection of ganglia in the sympathetic chain? Today, when the doctor's practice is mainly transient office and hospital practice, there are no such opportunities for the study of disease in space as existed by Yorkshire bed-sides or among the immense clientèle of the Salpêtrière. Retrospective studies of the familial distribution of disease in space from existing records would be a way out, incidentally one of the most fascinating prospects held out by the future science of geographical or global medicine. Very important too, are the studies, actual and prospective, of Professor Sigerist upon the relations of civilization and disease, which connote a certain philosophic parallelism with the larger problem of the effects of civilization upon the status of medicine in space and of medicine upon the spread and advancement of civilization in space. Another important line for future cooperative investigation is the closer study of the impact of disease upon particular ethnic stocks or the reactions of race to disease, with special re-

gard to the effects of mongrelization and change of environment. Yet another is the relative importance of character and mentality in the general run of the medical profession, in other words, the remarkable development of crime and of criminaloid traits of character even among physicians since the World War. On this head, the novelists are profuse and voluble, the English and American being more dramatic and sensational in their approach, the German more scientific. Some of the German medical periodicals, in fact, have deliberately posted current instances of crimes perpetrated by medical men. Of old, the doctor was ridiculed everywhere as an actual or potential killer at the bedside and there were mediæval physicians who kept patients on their books by keeping them sick or making them sicker during convalescence. Never make your doctor an inheritor was an old Latin proverb. Today, ways and means of "getting away with murder" are manifold and the detective or mystery stories often put scientific weapons into the heads or hands of the criminal-minded. The *crux* lies in the definite break between the tendency of the past to protect society by punishing the guilty, to the extent of sometimes executing the innocent, and the present aim to protect the innocent to the extent of releasing many of the guilty upon legal technicalities. The criminal exploitation of medical science and of the professional status by adventurers, *intrigants* and thugs is an unwritten chapter in the annals of medicine. Finally, there is the aspiration of the League of Nations toward global sanitation and world-control of disease. This is probably the only line of endeavor in which its efforts will be finally fruitful: since to wish or decide that wars may not exist in future is velleity but not volition. The new science of geopolitics, from which geomedicine confessedly derives, does indeed plan to triangulate the political and social status of all nations and peoples; and such knowledge might eventually be utilized in aid of forestalling the possibility of future wars and rumors of war. But these sciences are as yet gerundive or inchoate and their practical application to the world's business seems millennial. The great

difficulty with pacifism is, in fact, that it postulates a purely imaginary or ideal world, realizable perhaps hundreds of years hence, but populated exclusively by plaster saints and stage angels, who, as Emerson put it, are fain to "hang on to the huckleberry bushes to keep from being translated to the skies." It is the eternal opposition between the schizophrenic idealist of Don Quixote type, tilting vainly for the forlorn hopes of the *mens sibi conscia recti*, and the pycnic materialist of Sancho Panza type, adapted physiologically to the ways of the world, which idealist and fanatic will never quite succeed in unmaking. But, as pycnics, like attempts at government, are manic-depressive, there is always some faint possibility of the awakening implicit in the line of Baudelaire—

"Eh bien, mon cœur, dors ton sommeil de brute,"

which Matthew Arnold rendered so neatly, without intention—

"Live we like brutes our lives without a plan,"

and successful planning for the future of humanity will imply, if nothing else reasonable insight into the probable needs of whatever people may constitute the world of the future. In the world, as at present constituted, the idealists seem, in Carlyle's expression, "more winged than solidly ambulatory," the *erdgebunden* display the indifference of all natural shock-absorbers to untried paths, and we see as in a glass, darkly, with reference to the Soviet, the first great outdoor experiment of altruism along purely materialistic and mechanistic lines.

The decisive lessons of geomedicine were learned on the battle-fronts of the World War, from which its origins may be said to date. The mobilization of gigantic bodies of troops on the Eastern, Western and Italian fronts, exposed to the impact of strange diseases as never before, proved to be an unique *plein air* experiment in the possibilities of mass-sanitation and salvage of the sick and wounded. So effective were the means available for coping with communicable diseases that, apart from the experi-

ence of the German Army in the Franco-Prussian War, the mortality from battle wounds exceeded that from disease for the first time in history. At the end of the war came the epidemic of Spanish influenza, which, by reason of the unsuspected hæmolyticus element, baffled the medical profession to the extent that its destructive power approached that of the great mediæval epidemic of plague or the Asiatic cholera of the post-Napoleonic period. Even among soldiers, the mortality from Spanish influenza was greater than that resulting from the battle-wounds and trench diseases of the World War. It is from such terrible lessons as these that the future science of geomedicine derives its objectives, if not its inspiration. To geomedicine, the medical historian of the future must look for his data through successive periods, for he will be concerned, not only with the achievement of a few advanced civilizations, but with the medicine and sanitation of the whole world (*la médecine globale*).

The physician or sanitarian who writes the first going treatise on geomedicine will make an enviable record for himself in the annals of our profession. Such a task will never be compassed by shallow, superficial reasoning from hastily assembled, hence insignificant data. It will require "courage stout," years of travel, years of patient labor, rich funds of humor and saving common sense, a literary feeling for what is luminous rather than voluminous, and above all an appreciation of the altruistic sentiment underlying the thought of Descartes, that medicine may be the great civilizing agent of the future. *Les grandes pensées viennent du cœur.*

F. H. GARRISON

REPORT OF STUDY OF ADMINISTRATION OF CONVALESCENT SERUM IN THE TREATMENT OF POLIOMYELITIS

Since Professor Netter of Paris first introduced the therapeutic use of convalescent human poliomyelitis serum in 1911, the therapeutic employment of the serum has gradually extended until it has become widely resorted to wherever convalescent serum can be obtained. In the early years there was little discrimination in its use, paralytic and preparalytic cases being treated indifferently. During the latter period, the tendency has been more and more to restrict the serum to early, preferably preparalytic, cases of the disease. The consensus of opinion has been that the convalescent serum is therapeutically valuable. It has, however, been recognized that epidemic poliomyelitis is clinically a highly variable disease. The manifestations are protean in their variety and degree of severity. As the diagnosis has been increasingly perfected, larger and larger numbers of cases of mild illness have been included in the classification of the malady.

At the time this study was begun no considerable outbreak of poliomyelitis had occurred in New York City since the overwhelming epidemic of 1916. However, indications were not wanting in other parts of the United States, as well as in Europe, that the epidemic disease was again becoming active. In 1926, Dr. George Draper stated that the only hopeful method of treatment of poliomyelitis was by use of convalescent human serum administered in the preparalytic stage of the disease, and he suggested that the Academy of Medicine keep a supply of the serum on hand.

Impressed with the growing severity of outbreaks of poliomyelitis in the United States, Dr. Simon Flexner made a similar suggestion to the Academy, which suggestion was referred to the Public Health Relations Committee in 1928. Before the matter was discussed with the Public Health Relations Committee, the Director conferred

with Dr. Louis I. Harris, then Commissioner of Health, who stated that he had no facilities for collecting the serum. He approved the proposal that the Academy undertake to collect serum and to distribute it under conditions of control (having in mind a critical study of the therapeutic results obtained).

The Public Health Relations Committee also approved of the project and appointed a special committee consisting of the following:

Dr. Harold L. Amoss	Dr. George Draper	Dr. Josephine B. Neal
Dr. W. Lloyd Aycock	Dr. Simon Flexner	Dr. William H. Park
Dr. E. H. L. Corwin	Dr. Royal S. Haynes	Dr. Philip Van Ingen
Dr. Linsly R. Williams, Chairman		

Dr. Philip Van Ingen was appointed Chairman, but was succeeded in the summer of 1928 by Dr. Linsly R. Williams. Miss Gladys Adams served as Secretary during the summer of 1928.

During the earlier meetings of the Committee in the spring of 1928 the following points were considered:

1. The value of convalescent serum and its method of administration
2. The collection of serum
3. Preparation of the serum
4. The administration of the serum and the compilation of records
5. Announcements to the medical profession

Dr. Alfred E. Fischer, a practicing physician in this city, and Dr. Herbert Scheffer, on the staff of Dr. William H. Park at the Health Department Laboratories, cooperated in securing blood from convalescent patients during the first six months. A considerable amount of blood was obtained from the following hospitals: Ruptured and Crippled, New York Orthopedic, Hebrew Home for Crippled Children and the New York State Hospital for Crippled Children. The Committee is very appreciative of the co-operation of the staff of these hospitals.

The amount of blood obtained from these sources was not constant and advertisements were inserted in the papers, asking convalescent patients to appear at a certain time so that blood might be taken from them, and with the co-operation of the Cornell Clinic, patients were seen there

on Saturday afternoons. A considerable amount of blood was obtained in this manner. The blood was taken to the laboratory of the City Department of Health, where the serum was prepared and several doses were distributed to the cooperating physicians. (For method of preparation see Appendix A.) This procedure was carried out in the summers of 1928, 1929, 1930 and 1931. During the first three summers a sufficient amount of serum was available as a very limited number of cases occurred in the city. In the summer of 1931, with a far larger number of cases, it was impossible to secure a sufficient amount of convalescent blood serum.

No definite rate of payment was determined upon to convalescent blood donors. A number of individuals who were well to do offered their blood gratuitously but in general most of the donors were paid from \$5 to \$10 and in many instances carfare or taxi fare was paid.

Administration of Serum

It was clear from the outset that the object of the Committee was to make a clinical study and not to supply every demand. Physicians were appointed by the committee and paid for rendering the following service:

1. Consultation with the family physician
2. Making complete examination and recording it on proper forms
3. Performing a spinal puncture
4. Making a cell count at the bedside
5. Administering the serum intraspinally and intramuscularly or intraspinally and intravenously
6. Making a second visit to administer second dose of serum on second day
7. Making subsequent follow-up visit

The physicians selected were chosen on account of their hospital experience and technical training and the fact that they would be available throughout the summer for work at any time.

After several discussions the Committee approved of a series of regulations which were distributed to the cooperating physicians. (See Appendix B.) It was also agreed by the Committee that a family would be asked to pay \$25

for the consultation, examination and administration of the serum to repay in part the cost of the collection and preparation of the serum and for payments to the physicians. It was suggested that in some instances families might be willing to contribute more than that sum, but that no money was to be demanded of families who could not afford to pay. The following physicians acted as co-operating physicians during the summer of 1928, 1929, 1930 and 1931:

1928			
H. W. Dargeon	Harry Mackler	Harry Mackler	
Leonard T. Davidson	James R. Reuling	William Messer	
Alfred E. Fischer	Stanley Pettit		
T. T. Mackie	E. D. Scala		1931
Carl Smith		Alfred E. Fischer	
Scott Johnson	1929	Jacques Lewis	
Herbert Scheffer	Alfred E. Fischer	Sidney Leader	
Charles Weymuller	Jacques Lewis	Harry Mackler	
Lambert Krahulik	Harry Mackler	Carl Smith	
Joseph C. Regan	William Messer	William Messer	
Samuel Cohen	Joseph C. Regan	Stanley S. Lamm	
William Messer		David Merksamer	
David Greene	1930	K. Kingsley	
Herman Frosch	Alfred E. Fischer	Milton E. Robbins	
	Jacques Lewis	Harry S. Lichtman	

The Committee also discussed at one of its meetings the possibility that physicians might oppose this type of work and that the family physician might object to having the serum administered by the co-operating physician. It was found in a number of cases that the family physician desired to administer the serum himself, though in most instances he preferred to have the serum administered by one of the cooperating physicians. No difficulties were experienced with physicians in this regard during the first three summers. During the summer of 1931 several complaints were made by physicians. Upon investigation these were found to be unreasonable.

Announcements to Physicians

Experience with earlier epidemics had indicated that there were many physicians who had never seen a case of poliomyelitis in the early stages. It was felt that treatment with convalescent serum was only of value in early

cases in the preparalytic stage. The following procedure was carried out: with the cooperation of the Commissioner of Health of the City, articles were published each year in the Bulletin of the City Department of Health, on the early diagnosis of poliomyelitis. These were prepared by Dr. George Draper. Announcements were also made in the Bulletin giving the names, addresses and telephone numbers of the physicians engaged in the study.

Medical Week, a weekly bulletin of medical announcements and medical news, published by the Medical Society of the County of New York, also rendered cooperation by carrying each year brief statements of the object of the study, the methods to be employed, the charges to be made, and the names, addresses and telephone numbers of the physicians.

Statements or interviews were not issued to the press as it was felt that it would be wiser if patients were referred by their family physicians and did not come directly to the physicians engaged in the study. There were, however, several interviews given to representatives of the press in the spring and summer of 1928, at the time that advertisements were inserted in the press to reach convalescent poliomyelitis cases who would be willing to serve as blood donors, as this was a novel procedure.

Experience of 1928, 1929 and 1930

In 1928, 521 cases of poliomyelitis were reported to the Health Department of the City of New York during the five months, June to October inclusive. There were 125 deaths, a case fatality rate of 26%. Sixty-one of these cases were treated with serum, among which there were 18 deaths, a case fatality rate of 29%. Twenty-one of these cases were treated in the preparalytic stage and there were 3 deaths, a case fatality rate of 14%. An effort was made to compare these cases with the number treated in the city hospitals of which there were 767, without any satisfactory conclusion.

During the four summer months of 1929 there were 38 cases of poliomyelitis reported in the city. Serum was

administered to 6 cases, 4 of which were treated in the preparalytic stage, and of these, 3 recovered without paralysis.

In 1930 there were 27 cases reported to the Health Department during the four summer months. Of these 14 were treated, 6 in the preparalytic stage, 5 of which entirely recovered.

Experience of 1931

The number of cases reported to the City Health Department during the year was 4,154, of which 4,058 occurred during the months of June, July, August, September and October. Five hundred and two deaths were reported, a case fatality rate of 12.1%. The Committee's physicians visited approximately 800 cases. During part of this period it was not possible to respond to every call or to administer serum as the amount was at times either limited or not available. Four hundred and seventy-seven cases were treated in the preparalytic stage and among these there were 18 deaths, a case fatality rate of 3.8%. Observations were made of 102 cases in which no serum was administered, and in these cases there were two deaths, a case fatality rate of 2%.

Statistical Study

The completed record cards of 477 cases were submitted to statisticians who compiled tables which show the monthly incidence of cases, the extent of paralysis of the treated and untreated cases at the time of visit and the resulting paralysis of 459 of these cases. The paralyzed cases were classified at the time of discharge and again three months later. The usual tables were also made in regard to sex and age incidence, as well as temperature, onset and cell count. Tables were also compiled indicating the results of treatment by different days from the onset of meningeal symptoms and the result in accordance with the amount of serum administered.

As the serum was administered either intraspinally and intravenously or intraspinally and intramuscularly, these

results were also tabulated. A comparison was also made between the cases selected for treatment with serum and those not treated.

Consideration of the Results of the Poliomyelitis Study

As indicated earlier in this report, it was felt that it would not be possible to state whether the convalescent serum was of real value or not unless a comparison was made between the treated group and the untreated group of patients.

Several considerations immediately arise which color the entire situation :

Among the 4,154 cases reported in the city during the year 1931, the case fatality rate was over 12% and the case fatality rate among the 477 treated cases was 3.6%. This fact, however, does not warrant the conclusion that the treatment produced a far better result in terms of lower mortality. The following questions also suggest themselves: How many unreported mild cases were there in which there were only prodroma or mild meningeal symptoms not developing paralysis? How many other forms of mild cases with slight weakness or temporary paralysis were not reported? Were the cases referred to the physicians cooperating in the study in general of a milder nature than those reported to the Health Department? Did the family physicians who sought the serum treatment for their patients recognize the fact that it was useless to treat bulbar or frankly paralyzed cases? Was this group of physicians better informed on the diagnosis of poliomyelitis and did they seek the serum treatment as soon as they suspected poliomyelitis? Naturally, these questions cannot be answered any more than if one were making a similar study in a similar way of the results of treatment in any other disease.

When one goes farther, as was done during the period in which no serum was available when 102 untreated cases were followed and it was found that in this group the mortality was slightly less than 2%, a similar series of

questions arises. First, were the treated and the untreated group comparable? In an endeavor to ascertain whether or not the untreated group was a milder group than the treated group, each physician was asked to classify his cases as "mild," "fairly ill," "seriously ill," or "extremely ill." Statistical analysis of the data based on this grading of the cases comparing the treated with the untreated group and computing the difference between the two groups with relation to the seriousness of the illness of the individual cases composing them, show that the untreated group was indeed a much milder group than the treated group. There were also differences in age distribution and other factors which may have influenced the end results.

Conclusion

The results of the study are therefore inconclusive. Many of the members of the Committee and the physicians who took part in this study feel that more accurate and more intensive work should be done along these lines.

The Committee expresses its gratitude to the several individuals who contributed funds for the purpose of making this study and also expresses its appreciation of the willingness on the part of many persons previously affected with poliomyelitis, who voluntarily gave of their blood to the Committee. The Committee also expresses its satisfaction with the work performed by the cooperating physicians, who devoted their best efforts under many trying circumstances, not only to help children who were affected with poliomyelitis, but who also kept careful records of the work performed.

LINSLEY R. WILLIAMS, *Chairman.*

APPENDIX A

PREPARATION OF POLIOMYELITIS CONVALESCENT SERUM

In selecting convalescent donors for the preparation of serum account is taken of their general physical condition,

age and body weight. The amount of blood taken is determined by these factors. From healthy children 13 to 16, the amount drawn varies between 175 and 250c.c. From adults 500c.c. may be taken if necessary, and in the case of professional donors this amount may be removed once in 3 weeks if their condition allows. It is customary to pay the professional donors \$10.00 for 100c.c. drawn. Probably the more recent the attack of poliomyelitis, the more efficient will be the serum, though there is no definite opinion on this. There is evidence of the presence of immune bodies in serum from patients 20 years after the attack.

In drawing the blood, the subject reclines with head slightly elevated. After painting the antecubital region with iodine and washing with alcohol, a tourniquet is applied above the elbow and a large gauge Luer needle is inserted into one of the superficial or deep veins. The needle is connected by sterile rubber tubing to a rubber stoppered sterile 500c.c. wide mouth bottle. The air in the bottle is gently evacuated by means of a small hand suction pump connected by another piece of rubber tubing. The bottle should not be filled over half full of blood so that clotting may take place in a slanting position. After allowing the bottle to stand slantwise, at room temperature for $\frac{1}{2}$ hour it is transferred to a refrigerator and allowed to remain for 24 hours. The more or less clear serum is drawn off in a suitable sterile bottle and the clot is separated from the sides of the bottle with a sterile glass rod, and returned to the refrigerator in an upright position. Within a few hours, additional serum may be poured off. This second lot will contain a great many red cells. Both lots are centrifuged to remove suspended red cells and then pooled. The preservative is then added as follows:

A mixture of tricresol one part, and ether two parts, is freshly prepared and added to the serum in such proportion that the serum will contain 0.3% tricresol. The addition is followed by agitation to thoroughly incorporate

the preservative in the serum. The serum is then passed through a mat of pulped filter paper and then through a Berkefeld Filter, W grade, and put in ampules, 18c.c. to the ampule. One ampule in every five is first rinsed out with about $\frac{1}{4}$ c.c. of serum, the rinsings being inoculated into a tube of deep veal broth. This serves as a sterility test for the serum, ampule and technique.

If it is not possible to obtain a recent Wassermann report on any donors used, a Wassermann test may be performed on the pooled serum from several individuals.

APPENDIX B

COMMITTEE ON POLIOMYELITIS

Instructions For Physicians Cooperating With The Poliomyelitis Comm.

1. The Committee on the study of the therapeutic value of convalescent serum for poliomyelitis has a limited sum of money available for trying out the value of the serum.
2. It is known that the cost of obtaining the serum alone will be approximately \$40 per treatment.
3. It is hoped that a proportion of this sum will be repaid by those receiving the treatment.
4. A sufficient amount of serum to treat two cases will be sent to each one of the cooperating physicians from the research laboratory of the Department of Health as soon as it is available. These doses will be accompanied by sterile flasks for spinal fluid.
5. The serum must be kept in an icebox until used.
6. Family physicians will usually call upon the cooperating physician from the Borough in which the cooperating physician lives and he will be expected to respond to any call.
7. When a cooperating physician receives a call from a

physician he will explain to him that the family will be expected to pay \$25 for the serum, which is less than the cost of obtaining it, and that there will be no charge for its administration.

8. The cooperating physician will also advise the physician to give the patient a dose of magnesium sulphate of such amount as the family physician deems necessary in accordance with the size of the patient.
9. A diagnosis will be difficult unless in the presence of a real epidemic, but if a probable diagnosis is made by making a cell count of the spinal fluid, the remaining spinal fluid withdrawn is to be placed in the sterile flask provided for the purpose and sent by hand to the Department of Health Laboratory, Foot of East 16th Street, in care of Dr. Neal, where further examination will be made.
10. The cooperating physician will then give the serum by one of the following methods, viz:
 - a. 20c.c. intraspinally and 50c.c. intravenously or intramuscularly.
 - b. 70c.c. intravenously or intramuscularly or both, depending on the condition of the patient.
11. Approximately twenty-four hours thereafter a second dose of 20c.c. will be given intraspinally if the first dose was given in this manner. If the first dose was given intravenously or intramuscularly, the second dose of 20c.c. should be given by the same route as the first dose.
12. Some people object strenuously to the administration of serum. In such cases the explanation should be made that the serum comes from human beings who are normal except that they have had poliomyelitis, and that their blood has been tested to be sure that it is free from any impurities.
13. A supplementary visit by the same cooperating physician will be made from two to three weeks after the

administration of the serum to ascertain the result, unless this can be learned satisfactorily from the family physician.

14. It is believed that the serum is of value in the preparalytic stage of the disease and it should not be given if paralysis has existed for over twelve hours. It must be remembered that the serum is presumably of no value after the paralysis has been recognized and that the amount of serum available for use will be very limited.
 15. The report cards will be filled out at the bedside and mailed to the Poliomyelitis Committee, The New York Academy of Medicine, 2 East 103rd Street; a check for \$25 should accompany the record. In the case of known indigent families, payment will not be possible and an explanation of this fact should accompany the report.
 16. Upon receipt of the report card which indicates that serum has been administered, the Academy will notify the Health Department Laboratory, and see that an additional dose of the serum is mailed to the physician.
 17. The cooperating physician will be paid by the Academy committee \$10 for the first visit and \$5 for the second and third visits, a total of not over \$15 per patient treated.
 18. It would be well if the cooperating physicians carried a copy of these instructions with them to show to the family physician or the family if necessary.
-

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NOVEMBER 4

The treatment of common injuries.

Wounds, burns, fractures, dislocations, joint trauma comprise the main group. Early definitive treatment the main clue to success. Antiseptics relatively valueless. Early reduction of fractures or dislocations means easy reduction and obviates the necessity for more elaborate operative or non-operative treatment. Automobile accidents almost epidemic.

John J. Moorhead, *Professor of Traumatic Surgery, New York Post-Graduate Medical School.*

NOVEMBER 11

Dietetic treatment of chronic Bright's Disease.

Presentation of the diets suitable for the treatment of chronic Bright's Disease according to clinical and experimental observations of the last decade. There are six factors in Bright's Disease that demand individual consideration: kidney pathology, renal function, blood pressure, edema, anemia, uremia. The optimal dietetic therapy of each of these conditions is discussed and these principles are applied to patients in which the six factors are combined in various ways. Herman O. Mosenthal, *Professor of Medicine, New York Post-Graduate Medical School.*

NOVEMBER 18

Etiology, diagnosis and treatment of chronic non-tuberculous lung infections.

The subject deals with chronic non-tuberculous pulmonary disease associated most often with infection of the sinuses, and hardly at all with the rarer non-tuberculous diseases such as spirochetosis, aspergillosis, etc.

David Riesman, *Professor of Clinical Medicine, University of Pennsylvania.*

DECEMBER 2

Migraine and its treatment.

The general problem of migraine will be presented with a short description of its historical background, its symptomatology, the various theories which have been advanced for its causation, the metabolic and chemical findings in those who suffer from its effects and the present situation in the therapy of the disorder.

Henry Alsop Riley, *Professor of Neurology, College of Physicians & Surgeons.*

DECEMBER 9

Psychiatric approach of the practitioner to his patient.

Mortimer W. Raynor, *Professor of Clinical Psychiatry, Cornell University Medical College.*

DECEMBER 16

Treating the pneumonia patient.

Alexander Lambert, *Visiting Physician, Bellerue Hospital.*

1933

JANUARY 6

Menopause disorders. (Lantern slides)

A general discussion of menstrual disorders with especial reference to dysfunctional bleeding, its relationship to cancer, and proper evaluation of constitutional nervous symptoms of the natural and artificial menopause.

William P. Graves, *Emeritus Professor of Gynecology, Harvard Medical School.*

JANUARY 13

The x-ray in the diagnosis and study of pulmonary tuberculosis.

Technique. Principles of interpretation. Indications for x-ray examination. Correlation of x-ray and physical signs. Correlation of x-ray findings with pathological lesions. Value in early diagnosis. In differential diagnosis. Importance of serial x-ray studies. Relative responsibilities of the radiologist and internist.

James Alex. Miller, *Professor of Clinical Medicine, College of Physicians & Surgeons.*

JANUARY 20

Indications for conservative treatment of gall-bladder disease.

Most diseases that affect the gall-bladder are not amenable to conservative treatment but are frankly surgical. These refer particularly to calculi, new-growths, and acute and sub-acute inflammatory conditions.

Low grade infections of the gall-bladder and ducts where function, as evidenced by cholecystography, is maintained lend themselves to conservative treatment.

(1) Dieting; (2) drug therapy; (3) biliary drainage; (4) Spa treatment. The use and abuse of any of these mediums will be discussed.

The greatest assistance may be rendered in ascending biliary tract infections where duodenal drainages offer alleviation. A discussion of the hepatitis which is an essential part of the clinical and pathological picture of gall-bladder infection will be undertaken.

Burrill B. Crohn, *Associate Physician, Mount Sinai Hospital.*

JANUARY 27

Gout and the uric acid problem in the practice of medicine.

Gout as a practical problem in medicine today. Painful conditions which might possibly be confused with it. Our laboratory knowledge of the condition will be discussed. An attempt will be made to assay the significance and reliability of the popular blood uric acid determinations in relation to conditions of ill health.

William S. Ladd, *Associate Dean and Assistant Professor of Clinical Medicine, Cornell University Medical College.*

FEBRUARY 3

The neurological examination and interpretation of neurological signs.

Neurological signs, what they mean and how you elicit them. The neurological examination as a procedure for investigating the physiology of the nervous system. Neurological signs show only anatomical localization. When one knows the localization of a lesion one can visualize the pathological anatomy from the history of the case and a knowledge of pathology. When one knows the pathological process one can then figure out the prognosis and treatment.

Louis Casamajor, *Professor of Neurology, College of Physicians & Surgeons.*

FEBRUARY 10

Medical and surgical complications in the diabetic: Their diagnosis and treatment.

Surgical conditions and surgical complications are of necessity encountered in a large proportion of individuals suffering from diabetes. Proper understanding as to the nature of these complications, and adequate procedure in dealing with them, are important. The matter of pre- and post-operative treatment of simple surgical conditions, as well as the management of the even more common infections and vascular lesions occurring in the diabetic, will be discussed. A method for the determination of the degree of vascular involvement and circulatory impairment will be presented with especial reference to the diagnosis and treatment of these lesions.

Albert A. Epstein, *Attending Physician, Beth Israel Hospital.*

FEBRUARY 17

Pyogenic infections of the genito-urinary tract.

Factors entering into the etiology of kidney infections. Bacteria and paths of invasion. Pathology and symptoms of the various types of renal infection—their diagnosis and treatment. Infections of the bladder, prostate and seminal vesicles, and their relation to infections of the upper urinary tract. Lantern slides.

Henry G. Bugbee, *Urologist, St. Luke's Hospital and Woman's Hospital.*

FEBRUARY 24

Thrombosis and embolism.

George David Stewart, *Professor of Surgery, University and Bellevue Hospital Medical College.*

MARCH 3

General infections in children and their treatment.

Royal S. Haynes, *Consulting Physician, Willard Parker Hospital.*

MARCH 10

Recent developments in the study of tuberculosis of interest to physicians.

The nature of the tuberculous process in man and animals. The relation of skin sensitiveness to the disease. (Allergy, immunity, and the tuberculin reaction). The need for a standard tuberculin for epidemiological and diagnostic studies. Improvements in the last five years. The implements used for epidemiological studies. (X-ray and tuberculin). Fallacies in conclusions under present methods. The import of modern studies in chemistry and biology to tuberculosis. The tubercle bacillus and its living chemistry. The monocyte and its life history. The serum and its contents.

Wm. Charles White, *Chairman, Committee on Medical Research of the National Tuberculosis Association.*

MARCH 17

Chronic arthritis.

A presentation of chronic arthritis with special reference to rheumatoid (atrophic; chronic infectious) arthritis and osteo (hypertrophic; degenerative) arthritis. Rheumatoid arthritis; bacteriology; streptococcus agglutination tests; relationship to rheumatic fever; subcutaneous nodules; value of sedimentation rate of erythrocytes; methods of treatment including results with vaccine therapy. Osteoarthritis; regarded simply as an aging of joints; the futility of vaccine therapy in this condition.

Ralph H. Boots, *Assistant Attending Physician, Presbyterian Hospital.*

MARCH 24

The management and treatment of the patient with coronary artery disease.

The importance of detailed instruction as to the mode of life of patients with coronary artery disease. The psychological handling of the patient is even of greater importance than the pharmacological. Factors influencing prognosis. Evaluation of methods of treatment.

Marcus A. Rothschild, *Attending Physician, Beth Israel Hospital.*

MARCH 31

BULKLEY LECTURE: *The care of the cancer patient.*

While some considerations will be given the special treatment of cancer, it is the chief purpose to stress some of the general considerations which always arise in a family, one member of which is afflicted. Problems of general medical care as well as precautionary and preventive measures, general medical care and supporting treatment,

specific medication as well as palliative measures for the more advanced cases will be discussed. Social problems relating to the care of the patient as well as the relationship between the family doctor and special practitioner will be referred to. In other words, an effort will be made to visualize the many problems attendant upon the management of a cancer patient from the viewpoint of the family physician rather than that of the specialist.

DOUGLAS QUICK

APRIL 7

Treatment of malnutrition of acute and chronic origin.

Alfred Stengel, *Professor of Medicine, University of Pennsylvania.*

RECENT ACCESSIONS TO THE LIBRARY

von Bergmann, G. Funktionelle Pathologie.

Berlin, Springer, 1932, 425 p.

Busson, B. Prophylaxe und Therapie der Infektionskrankheiten und Idiosynkrasien.

Wien, Springer, 1932, 237 p.

Castelfranchi, G. Recent advances in atomic physics.

Phil., Blakiston, 1932, 2 v.

Davies, E. C. H. Fundamentals of physical chemistry.

Phil., Blakiston, [1932], 370 p.

Delater, G. Les maladies des veines et leur traitement.

Paris, Masson, 1932, 371 p.

Duvernoy, M. L'inspection médicale des écoles. 2. éd.

Besançon, Chicandre, 1932, 236 p.

Erdmann, J. F. Erdmann's clinics.

Phil., Saunders, 1932, 315 p.

Girardi, P. Malattie dell' apparato digerente ed elementi di dietetica.

Torino, Unione Tipografico-Editrice Torinese, 1932, 626 p.

Kindberg, M. L. & Monod, R. A. J. Les abcès du poumon.

Paris, Masson, 1932, 322 p.

Labbé, E. M. Leçons cliniques sur le diabète.

Paris, Masson, 1932, 333 p.

Lebeuf, F. & Mollard, H. Les sels d'or en dermatologie et en syphiligraphie.

Paris, Masson, 1932, 148 p.

McDowall, R. J. S. The science of signs and symptoms in relation to modern diagnosis and treatment.

N. Y., Appleton, 1932, 440 p.

- Monscourt, H. J. P. *L'otorrhée gutturale*.
Paris, Maloine, 1932, 160 p.
- Nisio, G. *La diagnosi della tubercolosi renale nell' infanzia e negli adulti*.
Bologna, Cappelli, [1932?], 172 p.
- Pellegrini, R. *Trattato di medicina legale e delle assicurazioni sociali*.
Padova, Milani, 1932, 2 vols.
- Reding, R. *Le terrain cancéreux et cancérisable*.
Paris, Masson, 1932, 389 p.
- Rehm, O. *Atlas der Zerebrospinalflüssigkeit*.
Jena, Fischer, 1932, 35 pl.
- Sayé, L. *Pneumolyse intrapleurale*.
Paris, Masson, 1932, 238 p.
- Schlecht, H. *Blutkrankheiten*.
Dresden, Steinkopff, 1932, 197 p.
- Schulmann, Ernest. *Études cliniques de syphiligraphie*.
Paris, Masson, 1932, 290 p.
- Segre, R. *Le malattia del miocardio*.
Bologna, Cappelli, [1932], 482 p.

OBITUARY OF GRAHAM LUSK

The death of Graham Lusk, Associate Fellow of the Academy and one of its most distinguished members, occurred on July 18 of this year. Although he had no medical degree and thus was not directly concerned with Academy affairs, he gave invaluable help in carrying out the Academy ideals for the advancement of scientific medical knowledge.

Dr. Lusk was born at Bridgeport, Connecticut, on February 15, 1866, and at the age of twenty one graduated from the School of Mines of Columbia University. His interest was in Chemistry and following his graduation, he spent three years at the University of Munich, where he received a Ph.D. degree in 1891. During this period he worked in the laboratory of Carl Voit, and his association with that great teacher and scientist started him on his life work along the lines of metabolism and nutrition. On his return to this country he joined the faculty at Yale University and was Professor of Physiology there

from 1895 to 1898. During this time the union of the New York University and the Bellevue Hospital Medical Colleges had been brought about and in the reorganization which followed, Dr. Lusk was made Professor of Physiology. He held this position from 1898 until 1909, when he accepted a corresponding position at the Cornell University Medical College, retaining this until the current year. He made this transfer chiefly because of special facilities for calorimetric work, necessary in his metabolism experiments.

During his Professorship at New York University, Dr. Lusk developed a very marked interest in bringing into closer relationship the fundamental laboratory sciences and clinical medicine. This interest was started by his father, who had himself been a teacher of Physiology and it grew through his association with the two Janeways, especially Theodore, who was beginning his clinical career, and through his friendship with Friedrich v. Muller, who had been a student with him under Voit. With the idea of aiding in the advancement of scientific medicine in New York City, Dr. Lusk conceived and brought into existence the Harvey Society, at first an independent organization but now closely affiliated with the Academy. The purpose of this society was the diffusion of knowledge of the medical sciences through open lectures by research workers who were authorities in their fields. The financial support of the society came from a group of about two hundred associate members, all Fellows of the Academy, and the lectures were announced as being given under the patronage of the Academy. At the first lecture in 1905, Dr. C. L. Dana, President of the Academy, formally introduced the Society to New York. Thus there was, from the beginning, a relationship between the Harvey Society and the Academy. At the present time a Harvey Society lecture forms the program each month at a stated Academy meeting, and throughout its notable history the society has brought before New York audiences the leaders in the medical sciences. It has been a powerful force in advancing medical

education and in adding to the prestige of the Academy. Dr. Lusk was one of the small group which under the leadership of Dr. S. J. Meltzer established the Society for Experimental Biology and Medicine. This like the Harvey Society was originally an independent organization. It has become a national society with branches in different sections of the country but the New York branch is affiliated with the Academy and its monthly meetings are held at the Academy building.

In addition to these activities, Dr. Lusk encouraged young men planning a clinical career to work in his laboratory. Many took advantage of this to their great profit and three of them later became Professors of Medicine, Dr. Du Bois at Cornell, Dr. Barr at St. Louis and Dr. McCann at Rochester. In these and other ways Dr. Lusk although not a medical man himself, exerted a powerful influence in hastening the remarkable development of clinical medicine which has occurred in this country during the past twenty five years.

Dr. Lusk exerted a wide influence in other fields than those mentioned. He was one of the founders of the Society of Biological Chemists of which he served as President. He was Scientific Director of the Russel Sage Institute of Pathology. During the World War he served as a member of the Inter-allied Scientific Food Commission and his expert knowledge of nutrition was put to good purpose. His book on the Elements of the Science of Nutrition, first published in 1906 has gone through a number of editions and is accepted as the standard text in this subject. His research work on problems of metabolism and especially on diabetes stands out as especially noteworthy and he was recognized as the American authority along these lines.

Many honors came to Dr. Lusk. He was President of the Harvey Society, of the Society for Experimental Biology and Medicine, of the Society of Physiological Chemists. He was a member of the National Academy of Sciences, of the Royal Society of London, and the Royal Society of Edinburgh, and honorary member of a number

of foreign scientific societies. He received the honorary degree of Sc.D. from Yale, L.L.D. from the University of Glasgow and M.D. from the University of Munich.

On those who had the privilege of knowing Graham Lusk his character made a lasting impression. He was of a genuinely friendly nature and had a great attraction for young men. Those men whom he accepted as friends he believed in implicitly and without reservations. He was an idealist in science and without fear in expressing his convictions. His rugged honesty, his courageousness, his loyalty to his ideals and his great personal charm, these with his scientific attainment stamped him as a rare person.

GEORGE B. WALLACE

DEATHS OF FELLOWS OF THE ACADEMY

FRANK BILLINGS, M.D., 1550 N. State Parkway, Chicago, Illinois; graduated in medicine from Northwestern University, Chicago, in 1891; elected an Honorary Fellow of the Academy November 18, 1926; died, September 21, 1932. Dr. Billings was internationally known for his work in the advancement of medicine. From 1898 to 1924 he was Professor of Medicine in Rush Medical College and the University of Chicago. He joined the Medical Reserve Corps in 1908 and in the World War served in the A. E. F. and in the Surgeon General's office as head of the Division of Physical Reconstruction. He was Chairman of the American Red Cross Mission to Russia in 1917. He was President of the American Medical Association from 1902 to 1904, of the Association of American Physicians, of the National Association for the Study and Prevention of Tuberculosis, and of the Chicago Medical Society.

PETER AUGUSTINE CALLAN, M.D., 156 Park Avenue, Yonkers, N. Y.; Graduated in medicine from the University Medical College of New York City in 1867; elected a Fellow of the Academy November 1, 1888; died, October 4, 1932. Dr. Callan was a Fellow of the American College of Surgeons, a member of the American Academy of Ophthalmology, a member of the New York Society of Ophthalmology, a member of the Society of Alumni to City Hospital, and Consulting Surgeon to the New York Eye and Ear Infirmary.

RUSSELL AUBRA HIBBS, M.D., 135 East 36 Street, New York City; graduated in medicine from the University of Louisville in Kentucky, in 1890; elected a Fellow of the Academy April 6, 1899; died, September 16, 1932. Dr. Hibbs was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, Surgeon-in-Chief to the New York Orthopaedic Dispensary and Hospital, Consulting Orthopaedic Surgeon to Presbyterian, New York Infirmary for Women and Children, Beekman Street Hospital, New York, and St. John's Riverside Hospital, Yonkers.

EUGENE KLEIN, M.D., 1129 Park Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, Columbia University, New York, in 1915; elected a Fellow of the Academy November 2, 1922; died, October 2, 1932. Dr. Klein was a Fellow of the American Medical Association, a member of the Society of Alumni to Mount Sinai Hospital, and Surgical Pathologist to the Bronx Hospital, New York.

DEAS MURPHY, M.D., 30 Sutton Place, New York City; graduated in medicine from Dartmouth Medical College, in 1896; elected a Fellow of the Academy May 5, 1910; died, July 15, 1932. Dr. Murphy was a member of the County and State Medical Societies.

NEWTON BOOTH WALLER, M.D., 53 East 82 Street, New York City; graduated in medicine from the medical department of the University of California, in 1896; elected a Fellow of the Academy December 3, 1903; died, October 12, 1932. Dr. Waller was a Fellow of the American Medical Association, and a member of the County and State Medical Societies.

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VOL. VIII

NOVEMBER, 1932

No. 11

ANNUAL GRADUATE FORTNIGHT TUMORS

October 17 to 28, 1932

ADDRESS OF WELCOME*

JOHN A. HARTWELL

President, The New York Academy of Medicine

Five years ago when the Academy of Medicine first considered the possibility of establishing some undertaking in the way of a period of graduate teaching, a great deal of doubt was expressed as to the practicability of the plan. It was tentatively adopted by the Council as an experiment. After the first Graduate Fortnight there was still doubt as to whether it would prove to be a permanent success and would give a return commensurate with the effort and the expense involved. The decision to hold it a second year was, therefore, taken with some misgiving.

In extending a welcome to our guests at this fifth Graduate Fortnight, I am fully confident that the Council acted wisely in voting to continue the undertaking. It has now become so well established an institution and its educational value is so well recognized throughout the country that the entire profession has expressed an interest in its continuance. That more than seven hundred physicians have registered for this two weeks exercise under the present economic situation is ample evidence that the medical profession is receiving something that they consider of value.

*Delivered October 17, 1932.

The splendid work that has been accomplished by our Committee on Medical Education and its various sub-committees is witnessed in this Fortnight by the unusually qualified list of speakers who will address us and by the setting up of the truly remarkable exhibition of pathological and other material bearing upon the general subject of tumor growth.

In welcoming you to the Academy, I take very great pleasure in placing at your disposal all of our facilities during the two weeks that you will be our guests. While I cannot speak officially for other of our institutions than those which are taking part in the formal program, I know that I am expressing the wish of all our hospitals and educational institutions in saying that you are equally their guests and that they will make an equal effort with ourselves to make your visit interesting and profitable. I know that I can give you this assurance because of the experience of the Academy in receiving the hearty cooperation that it has from all those institutions in making New York City a centre wherein the practicing doctor can find opportunities for study in almost any field under most favorable circumstances.

I feel sure that a considerable number of you already appreciate my very great interest in the problem of the continued education of the practicing physician. I am fully convinced that the solution of very many of the serious problems which are confronting our doctors at this present minute depends upon the more complete education of the individual doctor who is serving the public.

Up to the present time, we have concentrated our efforts very largely upon giving every educational advantage to our medical students, to the residents in our hospitals, and in some cases to the hospital interns.

In addition to this, in various communities, a good deal of effort has been made toward giving formal postgraduate education to those who are so situated that they can avail themselves of the opportunities as students devoting their full time to this end.

I wish now to make a plea for the forgotten man, to whom in an educational sense this term is quite applicable. I am strongly of the opinion that there is a large group of men practicing medicine in this and every other community who are entitled to a help that they have not as yet received in the direction of their continued education while they are serving the public as practitioners and dependent upon this service for their livelihood.

It is not so long ago that many of our larger hospitals looked askance at the conception that their function went beyond the rendering of service to sick individuals and that they had a definite and determining responsibility toward medical education. Thirty years has revolutionized this viewpoint and now practically every well conducted hospital attempts to a greater or less extent to take a part in the education of medical students, their interns and their residents. I am sure that the time is now at hand when these hospitals and the universities with which they are associated must recognize that they have a still further responsibility and must so formulate their policies that they will be active participants in the continued education of the practicing doctor who may or may not have an official affiliation with their institution.

If one will give thought to the enormous educational facilities that exist in this city, it becomes easily apparent that they are ample to provide an increasing amount of education of this kind.

It is impossible to fail to recognize that the doctors themselves would receive such educational opportunities with enthusiasm. This Fortnight is strong testimony to the truth of this statement. You gentlemen are not going to make the effort to utilize an undertaking of this sort unless you see an educational value in so doing. It is also ample testimony that there are many men in this city who recognize their responsibility for this type of teaching because of the great effort that has been expended in making these Fortnights a success. You are here to see the completed program. Had you been here during the last six months

and able to appreciate the enormous amount of work that many individuals have done to set up the program, you would understand that men do realize the necessity that confronts us.

If you will visit our library any afternoon or evening during the year, you will have ample proof that our doctors are doing their best to educate themselves insofar as a library will permit.

It remains for us to convince those in authority in our large institutions of learning that they have a great obligation to carry forward this work. This Academy is definitely committed to the undertaking and I promise you that so long as I have any influence or activity in its councils, the matter shall receive constant consideration and that all of the prestige of the Academy shall be utilized in setting up a program whereby the continued education of the practicing doctor will be so available that no member of our profession will have an excuse for lack of education because of lack of opportunity.

The particular subject which the Committee has selected for our consideration during these two weeks is one that vitally concerns every member of our profession, no matter in what field he is working and equally affects every member of our community. We will hear statistical evidence that cancer is a dreaded enemy of our welfare. It will be pointed out to us probably that so far as can be determined its incidence is on the increase and that a constant fight must be made unless we are to suffer serious disaster at its hand.

There are thousands in our city who are asking themselves the question, "What is being done about this situation?" We may point out to them that the profession and its associated scientists are bending their constant effort to solve the problems connected with cancer.

In the last analysis, the solution that every one of them has in his mind is the finding of those facts or those factors which will lead to either a prevention or a cure of cancer.

That the best scientists in the country have been willing to come here and discuss these problems over this period of two weeks is ample evidence to the public that we are not unmindful of this necessity.

Two weeks is a very short period in which to profit by all the lessons that are so beautifully set forth in the demonstrations that are being conducted. However, an answer to many of the problems that constantly confront every practitioner will be found in these cases. It is impossible that you men will be able to leave this Graduate Fortnight at its termination without having had called to your attention much that will be of the utmost value in your daily work.

This should be an assurance to the public that the profession and its associated scientists are on the firing line and that insofar as human endeavor is able to achieve accomplishment, such accomplishment will be achieved.

There is no need for discouragement. Cancer is a dread disease. Few of us have been completely free from some personal evidence of this fact. However, it is not true to say that no progress has been made simply because neither the cause of cancer nor the cure of cancer is known. Great progress has been made toward the final determination of these. It may be too hopeful to say that either the cause or the cure will be demonstrable facts at any early or given time. It is not too hopeful, however, to say that great progress has already been made, that we do know curative means in many forms of cancer, that the fight is being successfully waged along many fronts and that cancer in some of its aspects has been robbed of the dread that formerly attached to it.

Every doctor of long experience can point to a large number of individuals who have suffered from cancer and who have been definitely and finally cured of it by means now at our disposal.

Our problem has been formulated, our attack is being

case we study a purely historical phenomenon. We have no observations of our own—we have to rely on observations made by other people and transmitted to us in literature. Now, there is another group of diseases, the clinical features of which were very well known centuries ago, of which, however, the cause and the pathological mechanism were discovered only in recent times. This is the case for most contagious diseases. When we study the history of these, our superior knowledge helps us a great deal in tracing them through medical literature. The history of such diseases has come to a certain close. They still exist, but we know them, and we know how to fight them. It appears to me that in the history of all diseases we can distinguish three different phases. The first might be called the empirical and speculative phase. The disease is known in many of its clinical features, and it is treated by empirical means with more or less success. Then comes a second stage when the cause and mechanism of the disease is discovered, and finally we have the third and last stage when on account of that knowledge the disease can be combated more successfully. In the history of tuberculosis, for example, we have reached this last phase. Through the discoveries of Koch and many others, we have a thorough knowledge of the disease, and I have no doubt that we will get rid of tuberculosis some day, as it is much less a medical than a social and economic problem.

Finally, we have a last group of diseases, the true nature of which is still unknown, and for which we still have no satisfactory cure. And this is the case with *cancer*. The medical historian, in tracing the history of cancer, has a very unsatisfactory task. I cannot tell you of high spots in the history of cancer, of periods of great discoveries, of waves of enthusiasm, as were observed when Koch discovered the tubercle bacillus, or Schaudinn the spirochete, or when Ehrlich brought out his salvarsan. The history of cancer is a dry history of errors and of many disappointments. The history of cancer is still in its primitive stage. The disease is still among us, threatening human society more than ever, and the fact particularly bewildering is

that we are facing a biological problem that doesn't fit into our general biological conceptions. However, even in such a case, a historical survey might prove of some interest. There might be some enlightenment, even in the history of errors. And after all, is there not heroism in the lost battle also?

First of all, it certainly is important to ascertain that in all probability malignant tumors occurred at all times and everywhere. Whenever we find medical documents, the Egyptian papyri as well as the cuneiform tablets of Babylonia, or the manuscripts of old India, we find descriptions relating to malignant tumors. And what is more important, we have bones of early historical man, showing evidence of such tumors.

In the medical literature of the ancient Orient, references to malignant tumors are scarce. And yet there is one very important passage in the Papyrus Ebers, a papyrus written in the 15th century B.C., where a tumor is mentioned, and where it is said that such a tumor must not be touched, meaning that in such a case treatment might prove fatal.¹ It is obvious that we have no statistical data as to the frequency of tumors in antiquity. Such diseases, however, were certainly not rare—they must have occurred rather often because in the Greek medical literature we find a great many references to them. In the Hippocratic collection, already, we find a great many such references. Then, in the works of Galen, in the second century A.D., there are hundreds of passages devoted to cancer and other tumors, and besides, he wrote a special monograph on tumors, our most important source. From the Middle Ages on there is not a single surgical book that has not at least one chapter on the subject.

The descriptions we find in the ancient medical literature are by no means unequivocal. In many cases it is quite impossible to decide what kind of tumor was meant. How can it be else? An accurate distinction of the differ-

¹*Papyrus Ebers*: translated by H. Joachim, Berlin, 1890. p. 193.

ent kinds of tumors was not possible as long as there was no microscope. And even then the cell had to be discovered, and the foundations of histology laid. Our systematization of tumors presupposed the work of Bichat, Schwann, Johannes Müller, Virchow, and others. Even today the diagnosis might be difficult in many cases, and we know how often we are obliged to make an excision in order to make up the diagnosis microscopically.

We must try to realize the situation in which the ancient physicians were. What did they see? They saw a swelling on the surface of the body—a swelling that grew, and occasionally ulcerated. They observed that there were such swellings that had an inflammatory nature. They were red, hot, painful, and the patient was feverish. They observed further that such swellings might turn into pus. But then they saw swellings with entirely different characteristics. These too grew, but they grew much more slowly. Some of them felt soft, just as does the fatty part of the body, and proved to be harmless so far. Others, however, were very malignant, and Hippocrates called these *karkinos*, or *karkinoma*; when they felt particularly hard he called them *skirros*. There was no cure for such a disease.

As long as one did not practise dissection of cadavers, the superficial tumors only were observed. And it was chiefly cancer of the breast that attracted the physicians' attention. Its crab-like appearance was responsible for its name, according to Galen. But by and by tumors were seen in hidden places also, as for instance on the cervix uteri, and in the anus. Sometimes tumors were felt in the abdominal cavity, and by analogy it was assumed that these must be tumors similar to those observed on the surface.

So, one result of the historical investigation is that cancer, malignant tumors at large, represent a disease general to mankind. It is not restricted to any country, race or period, but is a disease of the adult individual, just as are the diseases of the circulatory apparatus.

To trace the history of cancer in ancient literature is very difficult, chiefly because the nomenclature is confused. The same word signifies different diseases, in different authors. We must never forget that Greek medicine had a history of a thousand years, and that the conceptions we find in the Hippocratic writings were modified to a very large extent by the subsequent developments. Another reason why the identity of a disease described in antiquity is difficult to ascertain is that most Greek schools had a conception of disease very different from ours. They did not consider and describe diseases as a morbid entity, but described them as merely symptoms or groups of symptoms. It will be the task of investigators to examine the whole Greek literature very carefully in order to find out what the actual knowledge of the Greek physicians was in the case of cancer.²

What was the ancient therapy of such disease? In many cases the most salient feature was the ulcer, and the same treatment was applied as was used for other ulcers. Drugs, and chiefly metallic salts—salts of copper, and lead, then sulphur and arsenic were applied—preparations that proved efficient in other cases, and helped in the formation of granulations. Such treatments were recommended from Hippocrates on, even to our days. Sometimes the author reported that he had good results, and that the tumor was cured. But now, of course, we now that such a tumor in all probability was not cancer. Most of the ancient authors, however, did not expect much of such remedies, and tried other cures. They tried to destroy the growth either by canterization, or then they cut it out with the knife. But these operative treatments gave bad results, too. They did so because the surgeons had not the pathological-anatomical knowledge, nor the operative technique necessary

²The Book of Jacob Wolff: *Die Lehre von der Krebskrankheit*, (Vols. I, II, and III, Jena, 1907-1913.) is very valuable for the more recent period. In the chapter dealing with antiquity the author generally uses secondary sources, and is far from being satisfactory. I hope to publish a paper on this subject in the not too far distant future.

for such radical operations. They resigned, and the resignation of the most outstanding physicians in antiquity is perhaps best expressed by Celsus, in his famous *Encyclopaedia*. He says, "Some physicians used caustic remedies. Some cauterized, and others operated with the knife. The remedies, however, never did any good to anybody. On the contrary, by cauterization the tumors were activated, and grew the faster, until the patient died. When they were cut out they came back after the scar had been formed, and brought death also. To distinguish a benignant tumor that can be cured from a cancer that cannot is hardly possible. All we can do is to watch and see what will happen."

In spite of the resignation there were always surgeons who tried to help the patient by operating on him. Celsus himself recommends the operation, in some cases, for instance, for tumors of the lips, and an Alexandrian surgeon of the second century A. D., Leonides, seems to have had a method of operating on cancer of the breast. He operated only when the tumor was not too far advanced. He amputated "*a sanis partibus*," and cauterized the whole wound.

The pessimism, however, prevailed for many centuries. A Salernitan surgeon, Roger, tells us that he sometimes saw cancer of the uterus operated, but without any result; on the contrary, the patients died much sooner than they would have done without any treatment. And a century later another great surgeon, Lanfranchi, makes the very reasonable statement that cancer must not be touched if it grows in parts of the body that are "*nervis, venis, et arteriis intricatis*." They all agreed that only radical operations on an early growth would have any success; but radical operations at that time without satisfactory anesthesia, and without the means of preventing infection, were hardly possible. Whether a cancer was operated or not depended chiefly on the temperament of the surgeon, the results in both cases being nearly the same, with very few exceptions.

The history of the therapy of cancer is very dull. The

principles we are following today, namely, the elimination of the tumor as radically as possible, were discovered in far remote antiquity. Our operative methods are much more efficient than theirs were, and besides the knife we have X-rays and radium to destroy the tumor cells, but we have not found any new principle yet.

And now to the problem, what did the physicians think of cancer? How did they explain the phenomenon of swelling? It is obvious that the theories of cancer were in accordance with the general pathological conceptions of the different periods. If I were to trace the history of the cancer theories in detail, I would have to trace the whole history of pathology. So all I can do is to point out some of the most important theories. Greek medicine distinguished three different kinds of growths. One "*secundum naturam*," was the physiological growth, the growth of the developing organism, the growth observed in the pregnant uterus, or in the physiological swelling of the breasts. Another was the growth "*supra naturam*," a growth pathological only in its quantity, as happens for instance when a callus is formed after a fracture. And finally there is a growth "*praeter naturam*," an abnormal pathological growth—the growth of the tumor.

According to the physiological theories of Galen, who developed and systematized the Hippocratic views, there were four "humours" in the human body—blood, phlegm, black, and yellow bile. If they were well balanced, man was healthy. A disturbance of this balance meant disease. The theory of the four humours was not bad at all. It explained a great many facts, and as a working hypothesis gave quite good results. In the case of tumors, obviously there too, the balance had been upset. Which humour was responsible for it? Galen thought that it was the black bile. Why? It seemed to him that people in whom the black bile dominated physiologically were disposed to tumors. It was believed that the black bile became thickened, and that in this way the tumor originated.

The Greek pathologists knew that in the human body

there is a natural healing power that endeavors to restore the lost balance of health. In all inflammatory processes, the way this healing power works seemed perfectly clear. The inflammatory swelling turned into pus, and the pus was drained out. In this way the "*materia peccans*" left the body, and the balance was restored. In the case of cancer, however, it seemed that the healing power of the organism did not work. There was no natural healing of tumors. The doctors' rules usually followed to help the organism in its healing tendencies could not be followed in this case. So in antiquity as well as today cancer did not fit into the general pathological conception. It was a puzzling problem for which satisfactory explanations could not be found, although Galen and many others did not admit it.

This theory of Galen's had consequences for the treatment also. Cancer, being the result of a disturbed mechanism of the humours, having therefore an internal constitutional origin, had to be treated internally too, and indeed Galen describes a certain diet to be followed by the patient suffering from cancer. Moreover, by applying purgative remedies and bleeding the patient, he endeavored to influence the humours. Galen's theories survived as long as the theory of the four humours did—that is, throughout the Middle Ages, the Renaissance, and far into the 18th century.

In the 17th century, however, a new explanation was sought for, according to the new pathological conceptions of the time. The discovery of the lymphatic vessels played a very important part. One thought that it was the lymph that carried the cancer material, and more than that, the lymph was responsible for the gathering of tumors. The vague hypothetic humours of Greek medicine did not satisfy the physician any longer. These had achieved much in the realm of science. The carriers of the balance of health were no longer thought to be the humours, but rather the physical forces, and chemical substances. And such a substance was that lymph. Alterations of the

lymph—its thickening or coagulation—might be responsible for the origin of cancer. The French school advanced this theory, as did John Hunter, and this theory brought further new improvements in the treatment that resulted in operating on or removing the lymphatic glands, and destroying the lymph vessels in the area surrounding the tumor. The operation became more and more radical, as for instance in the case of the cancer of the breast, where the pectoralis major was removed, as it was feared that it might be affected by the lymph.

Particularly interesting are the views of John Hunter, a man we appreciate the more we study his works. He, too, believed in the theory of the coagulated lymph. But his conceptions are not the naïve mechanical ones of the past century. They are entirely biological. Cancer to him is a part of the body comparable to an organ. It is nourished by the vessels of the organism. And therefore he tried to isolate the tumor by compressing the blood vessels leading to it, or by making ligatures.

The lymph theory, however, was not satisfactory either. Doubts were expressed, chiefly by Morgagni. In his dissections he found a great many tumors, and was convinced that they were more than the result of the coagulation of the lymph. And yet he could not find any better explanation. In 1773 the Academy of Lyons offered a prize for the best answer to the question "What is Cancer?" A young man by the name of Bernard Peyrille got the prize for a thesis that gives a very good summary of the knowledge of the time. "There must be a special cancer virus," he said "that is responsible for the alteration of the lymph." He tried to make experiments. He injected cancer material taken from a cancer of the breast, into a dog. Unfortunately, the experiment did not come to an end. The dog barked so terribly that it was killed by the doctor's landlady.

In 1802 a society for investigating the nature and cure of cancer was founded in England. It issued a questionnaire that was sent to all prominent physicians, the ques-

tions of which could not be more sensible. "What are the diagnostic symptoms of cancer?" "What is the nature of cancer, principally its pathological anatomy?" "Is cancer a primary disease or can cancer develop out of other diseases?" "Is cancer hereditary?" etc. . . . Unfortunately the society was disbanded four years later without obtaining any significant results.

It was too advanced for the times. In 1802, the year that this committee was appointed, a man died in Paris who opened new horizons for pathological research, Xavier Bichat. His ways had to be followed in studying the problem of cancer, and this meant investigation of the tumors by the new methods of pathological anatomy. The French school followed Bichat's path, and did some creditable work on the subject. Laennec was the first to differentiate between homeoplastic and heteroplastic tumors. While scirrhus was often regarded as a pre-cancerous condition, he described it as a tumor of its own, as a growth of the connective tissues.³ Then the cell theory was established and Johannes Müller applied it to the tumors. Cancer was described by him as the result of specified cell-formations within the connective tissues of an organ. Virchow's work followed in the middle of the century. He described the heteroplastic tumors as proliferations of the connective tissue cells as a reaction against some kind of irritation. Thiersch and Waldeyer brought important modifications to Virchow's theory, and then Cohnheim established the theory of the congenital foundation for cancer. The 20th century finally was devoted chiefly to experimental research that was made possible by great advancement in physiological chemistry.⁴ Today we know infinitely more of the biology of cancer than ever before. And yet the problem is still unsolved. In the last 50 years, a great many theories were brought forth, but they all proved to

³See Fielding H. Garrison's excellent editorial on the history of cancer in this Bulletin (1926, 2nd series, Vol. 2, No. 4, pp. 179-185).

⁴Experimental Cancer, an Historical Retrospect. (From the laboratories of the Philadelphia General Hospital), by E. B. Krumbhaar, Philadelphia, Penna. *Annals of Medical History*, Vol. VII, 1925.

be wrong. Our therapy is much more efficient today than it was before this time, and yet we have not found anything new. We have followed the principles and improved on the methods that the Greeks already had, and our results are far from being satisfactory. I remember the great Berlin surgeon August Bier said to me one day, "If a great scientist at the end of a brilliant career wants to make a fool of himself, he takes up the problem of cancer." This, unfortunately, happened in many cases. And yet, the stronger the enemy, the more energy and the more intelligence we will have to develop in order to uncover his face and to fight him.

I personally have the feeling that the problem of cancer is not merely a biological and laboratory problem. But it belongs to a certain extent to the realm of philosophy. This, an "X" in the pathology of cancer, is a principle we do not understand yet. While we can understand most pathological processes as defence reactions or as healing processes, here we are facing a fact that does not fit at all into our general biological conceptions. Fortunately, we have overcome the speculative era in medicine. We know that a theory is not true by the mere fact that we think it to be so, but it has to be demonstrated and proved experimentally. And yet all experiments require certain philosophical preparation. And I have the feeling that in the case of cancer many experiments were undertaken without the necessary philosophical background, and therefore proved to be useless.

The Wesley M. Carpenter Lecture

FUNDAMENTAL RESEARCH IN CANCER*

FRANCIS CARTER WOOD

Just what is the nature of the fundamental research on cancer which is going on in a few laboratories in various parts of the world is but little understood by the average

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layman, or even by the profession. Both are confused by the usual weekly press notices of a new "cure" for cancer, and the layman learns, if he takes the trouble to inquire of his physician, that such announcements are usually of but little importance, but are compounded as a rule of hasty and imperfect observation, combined with a strong desire either for fame or money. The average life of these "discoveries" is rarely over a year. By that time most of the ignorant who have offered themselves as experimental animals for a hypothetical cure are dead or are dying, and when the knowledge of the uselessness of their sacrifice becomes public the "cure" disappears. The medical profession can only continue to rehearse the fact that the effective cures are surgery and radiation.

The average person who sees that considerable sums of money are being used to support cancer research wonders why no striking discoveries as to cure are reported from such institutions, and is apt to point towards the marvels of the telephone, the telegraph, the electric light and the radio as evidence that something must be wrong with the investigation of cancer, and if only sufficient money were available and enough pressure could be brought upon those studying the problem, that a cure should be produced in a short time. These people entirely confuse invention with discovery. The fundamental discoveries in physics which led to the development of the telephone and the radio were available many years before the inventor applied them to practical purposes. The principles which underlie an invention in these fields are, as a rule, relatively simple. They concern phenomena which can be produced in wires by electric currents, and are always reproducible under given conditions, and given a definite amount of industry and sufficient money, the practical development could be expected in a reasonable length of time. A somewhat similar condition exists in one phase of medicine, that of the infectious diseases, for since Koch and Pasteur laid the foundations of bacteriology in the seventies and eighties, many diseases have come

under control, either through prevention of infection, or direct attack by curative sera. We only have to mention diphtheria, lockjaw, typhoid fever and pneumonia. So far the control of pneumonia is imperfect, but inasmuch as serological technique is relatively simple and its principles are well known, it is merely a question of time, patience and money before pneumonia will be a disease curable by serum.

The cancer problem is entirely different. Here the student is dealing with not one disease, but a group of diseases, each one of which may have a variable group of causes. It is a disease which arises in the body itself, and does not apparently always require an outside agent to produce it, but may appear on a predominantly hereditary basis. In other types heredity seems to play no part. It is not due to germs, so that the knowledge of bacteriology does not help us in attacking cancer. It is a disease which appears in people apparently perfectly well. It may even be born in a child. As far as we know, the disease is one of life and growth, resembling in many ways the growth of a child in the womb, and yet more closely related to the mother than a child, for cancer has no father, only a mother, and the mother is the tissues of the body which in some way change so that the microscopic cells which compose these tissues can grow uncontrollably. Therefore cancer is a part of our own bodies, and being derived from them, it obviously cannot be very different from the healthy cells from which it grew. Hence it produces no reactions in the body other than those which the unborn child produces. Strange to say, cancer may give the same test which is given for pregnancy, that is, the child is a mass of growing tissues and causes certain changes which may lead to the early detection of its presence; so cancer is the same, and the Aschheim-Zondek test for pregnancy may be given by a man with a cancer. All this has been said to illustrate the fact that what we have learned from bacteriology concerning the reactions in the body produced by foreign cells entering and setting up disturbances is not

applicable to cancer, because cancer cells are not foreign. An illustration of the difficulty of the situation is that certain metals like lead may destroy the child in the womb and bring about a miscarriage. The same lead, while it may prove effective in curing a few tumors, is not as powerful in its destructive action on them as it is on the unborn child. The cancer problem, then, is as we now face it a problem of endeavoring first to do the best we can in obtaining cures by current methods which we know are effective, that is, surgery and radiation. The improvement in the technique of these methods is a just basis for research, and is carried on in every hospital where cancer patients are treated. We know at present that the limits of surgery have been nearly reached, and societies like the Society for the Control of Cancer are endeavoring to educate people to go early to physicians so that the growth may be diagnosed at a time when it is small and curable. Strenuous efforts are being made in clinics to develop the effectiveness of radiation treatment. But none of these methods, no matter how perfect, will ever cure even half the patients with cancer. If this be the case, the second phase of the cancer problem then must be that of fundamental research as to the nature of the disease or diseases in the endeavor to find out why it begins, how it grows, and what will check that growth.

There is no evidence that surgery, radium and x-ray will ever be 100 per cent cures for cancer, and the obtaining of this 100 per cent cure is the object of the fundamental investigation of cancer. This investigation uses the experimental machinery already set up by the modern sciences, in other words, it employs the methods of chemistry, of physics, and of biology. The success obtained in these sciences has been wholly due to simplification of the condition of the experiment. Laws are discovered not by studying the complex. Physics and chemistry are used in analyzing the structure and composition of the cell, both those healthy cells which make up the body and the diseased cells which form a cancer. At present it is necessary

in many of such studies to use cells of certain insects, such as the fly, *Drosophila*, or even the eggs of certain of the marine animals, like the starfish or similar creatures. We want to learn why a cell divides, for the rapid dividing of cells is what makes a cancer grow. That fact cannot be determined on a human being or on a mouse. We must simplify the experiment by using a cell which is free living so that it can be observed under the microscope. The cell must be able to stand rough treatment, so that it can have chemicals injected into it, or be subjected to electrical stresses. Such investigations have been going on for many years in institutions like the Marine Biological Station at Wood's Hole, or that in Naples, and a number of other places. The fact that the electrical charges in cells are altered when a cell divides; that the permeability of its cell wall changes during division; that its contents undergo remarkable alterations; that its reaction may be determined by injecting a dye into the cell, using a minute glass pipette while the cell is watched under a high power microscope (thus certain simple cells have small areas where acid collects, which no doubt forms the precursor of the digestive juice); that the reaction of the cell may be changed by varying the amount of the oxygen which it receives, etc.—all these things have been learned from what we may term biophysics or biochemistry of the cell, that is, a mixture of the three sciences. Such mixtures of scientific specialties are proving exceedingly fertile in discovering things about cells. In other words, every biological station in which sea-urchin eggs are being studied is in a sense contributing to the cancer problem, for we must remember that the cancer problem is a problem solely, so far as we know it, of the division and continuous growth of cells. Ordinary analytical chemistry destroys the substance which it analyzes, and therefore has told us little about the cells. We know that certain metals exist in the body and in tumors in minute amounts. Some are probably accidental and derived from the food. Among these are silver, lead, chromium, arsenic, titanium, zinc, lithium and rubidium. Copper and iron play an important part in

keeping the blood up to its standard level, while sodium, potassium, calcium and magnesium are essential to life. We know the cancer cell contains more water and more potassium than the normal cell. We know that it usually breaks down sugar in a way different from many normal cells. Yet it contains ferments which normal cells contain, and in fact, the more we investigate, the more we find that the cancer cell in its composition and its ordinary activities, which we are capable of studying, does not vary essentially from similar normal cells growing at the same speed. It is probable, though not certain, that before we can find a means of stopping the growth of a cancer cell, we must find a means of making it grow, or find the reason why it grows. This leads to the problem of various regulatory substances in the body known as hormones. Everyone knows that if a certain gland does not secrete, the child becomes an idiot. Another gland secretes too much, and the child grows into a deformed giant. When, however, we study the cell under the influence of these glands, we find that the cell does not grow large or become dull and idiotic under the same conditions as the body does, and that the cancer cell, so far as we know, is independent of such controlling influences. That is probably why it is a cancer cell. But how and why?

Much work has been done on the relation of cancer cells to vitamins and diet. Apparently these play but little part in the life of the cancer cell. It seems to be able to obtain food in competition with the body cells so that the patient may be dying, while his cancer grows, and the removal of vitamins from an animal bearing a cancer, while it may keep the cancer from growing very well because the animal is sick, nevertheless no removal of vitamins will stop the cancer. The question has been raised whether the cancer does not make its own vitamins.

It will be seen from this discussion that every angle of attack leads but to fresh problems. All of this research work which has been so far mentioned must be carried on. Thus far a few general directions in which fundamental

cancer research has been pursued have been discussed. It is obvious that the fundamental conditions of the life of a cancer cell cannot be learned from the study of human beings. In the first place, human patients bearing cancer cannot be experimented upon. They must be given the best treatment that is known to science. It is therefore necessary to use animals having cancer. Fortunately they have practically all of the varieties of cancer from which human beings suffer, and fortunately also it has been found that many of these cancers in albino rats and mice can be transplanted by the injection of a few cancer cells under the skin of an animal, after which, in a longer or shorter time, a tumor of exactly the same sort as that originally injected will appear. This important discovery was made simultaneously in 1891 by Dr. Leo Loeb, now in George Washington University, St. Louis, and by Professor Jensen, of Copenhagen. It immediately permitted a very large series of studies to be made upon tumor cells growing in what may be described as a living test tube. That such grafted tumors are exactly the same as a primary human tumor no one has assumed. Neither has anyone assumed that a culture of tubercle bacilli in a test tube was tuberculosis. Nevertheless, a large part of our advance in the knowledge of tuberculosis has been made by studying such test-tube cultures. Transplanted cancer in animals has also been extremely useful in furnishing general facts concerning the biology of the growth of masses of cells. All that has been learned obviously cannot be summed up here, but the most important facts are first that such grafted tumors have similar rhythms of growth which have been observed in human tumors; that if they disappear, which some of them do, the animal may or may not become resistant to a fresh inoculation. After the growth of a tumor has once become well started, the injection of substances into the circulation will not cure it. An enormous amount of routine experimentation along this line of what may be called the Edisonian type has been carried on in the last twenty years. Almost every known aniline dye, many of the alkaloids, all of the metals and many of their

compounds in solution or a colloidal form, ground up tumor particles, filtrates from crushed tumor cells, extracts from all the organs, serum from animals which have been injected with cancer cells so as to produce an antibody, have all been tried and have failed with only two exceptions. Lead has been shown occasionally to destroy tumors, both in man and animals, but its use is attended with so many dangers and discomforts that it has had to be abandoned, though experimental work is being carried on in the attempt to mask the toxic effect of the lead on the healthy tissues and still leave sufficient poisoning capacity to attack the tumor cells, as is the case with salvarsan. So far nothing has been accomplished in this regard. As the lead is detoxicated, though it may not kill the animal, it becomes less effective on the tumor cells. The other example is that if a powerful antiserum is made against cancer cells by injecting them into an animal of another species, and the serum then placed in contact with a tumor by having the growth implanted in the limb of an animal, the serum being kept in the limb by a light ligature for a considerable time so that the cytotoxic substance may attach itself to the cell, it has been possible to cure inoculated tumors. Such serum, however, is powerless when injected into the veins, as it is detoxicated by the liver and other healthy tissues before it reaches the tumor.

Other important discoveries that have been made from grafted tumors are that massage of such transplanted tumors is extremely dangerous, for it presses tumor particles into the vessels, from which they reach the rest of the body; and another that the careful removal of a piece of a tumor does not increase the number of metastatic emboli to the lungs. Grafted tumors have been also extremely useful in testing alleged cancer cures, and in measuring the doses of x-ray or radium necessary to destroy all the cells of a malignant growth. The use of these inoculated cancers has shown that if they are placed in dense fibrous tissue they may remain inert for a long period, though they do not lose their vitality in any sense. This hints that we may ob-

tain cures by x-ray and radium not so much by direct destruction of the cells, as at least partially by locking these cells up in the atrophic and dense fibrous tissue which is produced by the action of the radiation.

The processes which underlie the immunity to inoculation just referred to are of great scientific interest, as it may open the door to the ultimate prevention of metastases, if not to the cure of the original growth. But this immunity is rather variable and cannot be produced against all tumors, and it should be noted is an immunity to inoculation only, not to growth. An animal which is immune to one tumor may be susceptible to another, and such an immune animal may develop a primary tumor, though immune to an inoculated one. Therefore this type of immunity is not curative, though if we knew more about the biological mechanism which underlies it, some useful lead might be found. Suppose the immunity were found to be due to a simple chemical, as thyroxin and adrenalin have been found to be, then if synthesized a cure might be available. But there is not an atom of knowledge as yet available as to the composition of such immune substances.

These transplanted tumors have furnished valuable and interesting general information concerning the chemical changes in the blood which follow the growth of a tumor, but this is not specific for tumors, because the same changes are found in pregnancy. All attempts on animals with tumors, and also on human beings, have failed to reveal any antibodies of a type which are so useful in the diagnosis of the infectious diseases. This is to be expected, as the cancer cell is not an external parasite of different chemical composition from the body in which it grows. It is this difference in chemical composition of the plants which we call bacteria which incites the chemical reactions which produce antibodies in the body in an effort to neutralize the poison and thus cure the disease. The study of such grafted tumors has covered so many aspects of the cancer problem that further work offers little promise of

valuable return. As has frequently been observed in scientific investigation, the point is reached where a particular line should be dropped and another taken up. Later discoveries may warrant a return to the use of grafted tumors, but at present investigation has become more fruitful in the attempt to produce tumors by irritants of various sorts, such as tar, certain types of lubricating oil, and some synthetic aromatic compounds which possess fluorescence. It was observed that the oils which are carcinogenic fluoresce and have characteristic absorption spectra. By building some simple organic compounds Kennaway and his co-workers have succeeded in preparing very effective chemical producers of cancer in mice and rats. One curious and as yet inexplicable fact has been observed in these irritation experiments, and that is that certain irritants which produce cancer in mice are not effective in rats, and also the reverse. The observation that certain parasites of the cat *Taenia crassicolis*, can induce the formation of tumors in the liver of the rat when the ovum of the parasite was fed, has been of interest, not only as demonstrating the great variety of tumors that can be produced by a single irritant, and some of them tumors of a type which are only normally found in bone, such as osteogenic sarcoma, but the reaction has been of use in studying the question of the inheritability of tissue susceptibility. There seems to be but little question after the fundamental work of Maud Slye that the selective breeding of mice may lead to a high concentration of spontaneous cancer, that is, cancer of which we do not know the cause, in the various organs of these animals, so that she possesses strains of mice which have only cancer of one organ. It is always dangerous to generalize from one material, and therefore it was interesting to take up the study of the possibility of producing by selective breeding an organ sensitivity to a known irritant, and Drs. Bullock and Curtis at the Institute of Cancer Research have been able to show that such a sensitivity can be obtained by selective breeding. This is revealed by feeding the ova of the tapeworm of the cat, and noting the occurrence of tumors in the liver. While rats

would never have sarcoma of the liver if they were not infested by ova, by breeding strains in which the tumor has grown, Bullock and Curtis have been able to obtain evidence that such susceptibility is transmissible and can be concentrated. This type of cancer therefore differs from those observed by Mand Snye in that in her experiments the tumors appear spontaneously. In the work just mentioned the susceptibility must be elicited by a specific irritant. That this susceptibility is local is proved by the fact that the skin of these animals remains resistant to tar painting. A curious fact is that the parasite which will cause a sarcoma of the liver in a rat will not cause it in a mouse, though the parasite will grow in the mouse liver.

We have mentioned above the differences in susceptibility to tar between the rat and mouse. The rabbit also is susceptible to tar irritation; the guinea pig and dog are not, though these animals also have other tumors, but again for a reason which we do not know, guinea pigs have very few cancers, while dogs have many.

Just what these facts will lead to in connection with the human race may not be obvious. Some of them may only increase our knowledge of general biology of the mammalia. Others may sharpen our wits to observe matters which have hitherto not been observed in the human being. An example of this is the cruel human experiment which has been witnessed in the production of bone sarcomata resulting from the ingestion of a radio-active substance. We now know that all this could have been avoided if someone had put the radio-active substance into rabbits and observed them for a sufficient length of time, because these agents produce osteogenic sarcomas in rabbits as well as in human beings. Here the human experiment unfortunately preceded the animal. One practical benefit, therefore, of all these studies in the production of cancer is that they furnish such knowledge of the cause of certain types of cancer as will permit the protection of human beings from irritations of the same sort. For instance, it is only a question of time when lubricating oils used under the

circumstances that give rise to cancer in certain industrial conditions will be purified before use so that the carcinogenic fraction will be removed, as it has been from the medicinal oils.

It will be seen that all this work so briefly cited has been with masses of cells and cells in a certain type of organism provided with supporting connective tissue and blood-vessels—in other words, an organism growing in the body. It is obvious that such an organism reveals only average effects, and of the variations which may exist between the cells and in their personal lives, so to speak, no clue can be obtained from such study. In 1907 Harrison observed the growth of nerve cells of a frog in lymph. Taken up by a group of investigators, notably Carrel at the Rockefeller Institute and Lambert and Haines, of Columbia University, and Fischer in Berlin, the technique has been amplified until it is now possible to grow mammalian tissue, especially that of young animals, with some ease. Obviously this method permits the study of the life of an individual cell and many interesting observations have been made. True, the cell is grown in an artificial culture medium made up of animal plasma. It is therefore not normal, and the results obtained from such observation must be critically judged. Nevertheless, it seems to be the only procedure available at present by which the biology of the mammalian cell can be studied with the same technical facility as that of the sea-urchin egg. The experimental conditions, as has been stated, are immensely more difficult than with the simple free-swimming ova, which have led to our knowledge of the mechanism of mitosis, the electrical and chemical reactions in the cell, and many kindred phenomena. Perhaps the most practical thing which has come out of such studies was the demonstration that the lethal dose of x-ray and radium for such growing cells, both of an animal tumor and of connective tissue, was approximately the same as that of a tumor growing in the animal. In other words, rapidly growing normal cells and rapidly growing tumor cells are about equally sensitive. Fortu-

nately for the therapy of cancer, healthy connective tissue cells are not growing rapidly, and therefore are more resistant to these physical agents than cancer cells, and there is in some instances a sufficient differential between the lethal dose of the cancer cell and the lethal dose of the normal cell to permit the destruction of the former without irreparable damage to the latter. This observation showed that the radiation destruction of a cell is not dependent upon any reaction of the host in which the cell is placed other than some circulatory insufficiencies induced by damage to the blood vessels. In other words, there is no immunity produced by the healthy cells which aids in the destruction of the cancer. This of course fits with the reasoning given above as to the fact that the cancer cell is a part of the body and differs from the normal cell only slightly. However, a sufficient number of interesting observations has been made to justify the hope that this method will be of great value when the technique is perfected so that we can grow human adult tissues freely. Among these are the final proof that cells of the lymphocytic group form fibroblasts; that cells of the liver and also the reticulo-endothelial system form bile; that the kidney cells make urea; that the heart muscle beats without nerve supply; that the phagocytic cells live off the tissues which they consume, while other cells obtain their growth material from the tissue lymph; that the sugar consumption of many growing cells is very high and may assume two forms, that is, glucose may be split into carbon dioxide and water, or split by way of lactic acid which is later oxidized in the liver. These are facts of interest obviously only in general physiology, and are not yet applicable to the problem of cancer, but when, as has just been said, human normal tissues and cancer can be grown frequently and continuously a field will be open for a great deal of research. Only one example need be mentioned, and that is the radiation sensitiveness of tumor cells *in vitro*. A far more accurate measure of the amount of radiation necessary in the treatment of human cancer than the clinical experience obtained by treating growths of which only the micro-

scopic morphology is known, and concerning which therefore we have not the slightest biological information, should be obtained by this method. If such tumors could be tested while growing in culture, the information would be extremely valuable. Unfortunately even the cultivation of adult connective tissue is not easy, and the adult connective tissue from a given organ may vary greatly in different persons. Perhaps there exists a number of different kinds of connective tissue, in the thyroid for example. At any rate, the cultures from different glands show great variation in their growth and survival rate in a standardized medium. It has been said that a single irritant may produce a great variety of tumors in the liver of a rat (some of these types are illustrated in the exhibit). Is it possible that the liver may contain a great variety of connective tissues, and that the morphology of a tumor ultimately depends on which type of cell is irritated and starts to grow, in other words, which type becomes cancerous first? Evidently the primary cell from which the osteogenic sarcoma of the liver arises is different from that of the large polyhedral cell sarcoma and also different from that of the small spindle cell sarcoma.

The question as to why a person has one kind of tumor or another daily arises in clinical medicine, and the answer will only come from the laboratory by just such studies as these. The old-fashioned chemistry, as has been said, has contributed little of interest to our knowledge of cancer. The more recent type of biological chemistry in the hands of Warburg, for instance, has shown the differences in glycolysis which we have mentioned. Studies are going on of the relation of certain sulphur compounds to tissue growth. It is interesting to see that these sulphur compounds may stimulate normal regeneration, but do not stimulate tumor growth, as though the tumor cell was growing at a maximum rate, in other words, that its auto-catalysis is 100 per cent. Will compounds related to these which stimulate cells check the growth of the cells? That is a line at present being investigated. It may check them in culture, and not check them in the growing body. This is an essential

fact, for though the pituitary may cause an overgrowth of the bones and tissues in acromegaly, the pituitary does not stimulate to any degree either tissue cells growing in culture or tumors growing in animals. Neither does thyroxin, which stimulates metabolism, increase the growth rate of cells in culture or increase the growth rate of tumors in animals. Thus what may be true of a complete organization is not true of cancer which is an organization independent of the control of the body.

I have said enough to indicate to you that the fundamental cancer problem is one of general biology, as was pointed out many years ago by George Adami, and that while the clinical study of cancer and the morphological classification of tumors is practically useful, it casts no light on the real problem, which is to discover some marked and constant difference between the cancer cell and the normal cell. Until such a marked and constant difference can be discovered, a vague, undirected search for a cancer cure is a waste of time. If such cure is ever to be obtained, it will not be by vague experimentation and injecting everything that can be thought of into the unfortunate patient, but by some revelation in the laboratory which will permit of a carefully thought out program of research, such as Ehrlich developed through many years before he achieved his great therapeutic discovery.

RECENT ACCESSIONS TO THE LIBRARY

- Ayrinhac, H. A. Marriage legislation in the new code of canon law. New ed.
N. Y., Benziger, 1932, 390 p.
- Beck, A. K. A reference hand-book for nurses. 7. ed.
Phil., Saunders, 1932, 354 p.
- van Beneden, J. Recherches sur l'infection.
Paris, Masson, 1932, 135 p.
- Capps, J. A. An experimental and clinical study of pain in the pleura, pericardium and peritoneum.
N. Y., Macmillan, 1932, 99 p.
- Conn, H. W. Bacteria, yeasts and molds in the home. 3. ed.
Boston, Ginn, [1932], 320 p.
- Creed, R. S.; Denny-Brown, D.; Eccles, J. C. [et al.] Reflex activity of the spinal cord.
Oxford, Clarendon Pr., 1932, 183 p.

Crile, G. W. [et al.] Diagnosis and treatment of diseases of the thyroid gland.

Phil., Saunders, 1932, 508 p.

Despard, L. L. Text-book of massage and remedial gymnastics. 3. ed.

London, Milford, 1932, 474 p.

Emich, E. Microchemical laboratory manual.

N. Y., Wiley, 1932, 180 p.

Engelbach, W. Endocrine medicine.

Springfield, Ill., Thomas, 1932, 3 v.

Horgan, E. J. Reconstruction of the biliary tract.

N. Y., Macmillan, 1932, 201 p.

Huddleson, J. H. Accidents, neuroses and compensation.

Balt., Williams, 1932, 256 p.

Huxley, J. S. Problems of relative growth.

N. Y., MacVeagh, 1932, 276 p.

I was a stutterer... Comments by J. S. Greene.

N. Y., Grafton Pr., [1932], 227 p.

Imperial college of science and technology. Huxley memorial lectures, 1925-1932.

London, Macmillan, 1932, v. p.

Irving, F. C. The expectant mother's handbook.

Boston, Houghton, 1932, 203 p.

Jewell, N. P. and Kauntze, W. H. Handbook of tropical fevers.

N. Y., Wood, 1932, 485 p.

John Gabriel (Sister). Professional problems; a text-book for nurses.

Phil., Saunders, 1932, 158 p.

Krueger, W. W. The fundamentals of personal hygiene.

Phil., Saunders, 1932, 291 p.

Kukowka, A. W. Der Krebs, seine Entstehung und Erklärung.

Wien, Maudrich, 1932, 118 p.

Lindsey, A. W. A textbook of genetics.

N. Y., Macmillan, 1932, 354 p.

McMillan, M. Massage and therapeutic exercise. 3. ed.

Phil., Saunders, 1932, 359 p.

Mead, S. V. Diseases of the mouth. 4. ed.

St. Louis, Mosby, 1932, 932 p.

Military surgeon. Military medical manual.

Wash., National Service Pub. Co., [1931], 774 p.

Miller, C. J. Clinical gynecology.

St. Louis, Mosby, 1932, 560 p.

Morgan, T. H. The scientific basis of evolution.

N. Y., Norton, [1932], 286 p.

National Bureau of Economic Research, (inc.). The purchase of medical care through fixed periodic payment.

N. Y., Nat. Bur. of Economic Research, 1932, 308 p.

Neustadt, R. Die chronische Encephalitis epidemica in ihrer gutachtlichen und sozialen Bedeutung.

- Leipzig, Barth, 1932, 103 p.
- Oliver, J. R. Psychiatry and mental health.
N. Y., Scribner, 1932, 330 p.
- Poole, E. Nurses on horseback.
N. Y., Macmillan, 1932, 168 p.
- Pringsheim, H. The chemistry of the monosaccharides and of the polysaccharides.
N. Y., McGraw-Hill, 1932, 413 p.
- Renshaw, A. Laboratory service and the general practitioner.
London, Milford, 1932, 267 p.
- Riley, W. A. and Johannsen, O. A. Medical entomology.
N. Y., McGraw-Hill, 1932, 476 p.
- Stocks, H. B. Water analysis for sanitary and technical purposes. 2. ed.
Phil., Lippincott, 1932, 135 p.
- Straub, G. F. Surgery of the chest.
Springfield, Ill., Thomas, 1932, 475 p.
- Sutton, R. L. and Sutton R. L., Jr. An introduction to dermatology.
St. Louis, Mosby, 1932, 565 p.
- Thom, D. A. Normal youth and its everyday problems.
N. Y., Appleton, 1932, 367 p.
- Van Es, L. The principles of animal hygiene and preventive veterinary medicine.
N. Y., Wiley, 1932, 768 p.
- Zweig, S. Mental healers: Franz Anton Mesmer, Mary Baker Eddy, Sigmund Freud.
N. Y., Viking Press, 1932, 363 p.

PROCEEDINGS OF ACADEMY MEETINGS

OCTOBER

STATED MEETINGS

There was no Stated Meeting of the Academy on October 6.

Thursday Evening, October 20, at 8:30 o'clock

Program arranged in conjunction with the
ANNUAL GRADUATE FORTNIGHT

- I. EXECUTIVE SESSION
Election of Fellows
- II. PAPERS OF THE EVENING
 - a. The historical development of the pathology and therapy of cancer,
Henry E. Sigerist, Director, Johns Hopkins University, Institute
of the History of Medicine
 - b. THE WESLEY M. CARPENTER LECTURE:
Cancer research, Francis Carter Wood, Director, Cancer Research,
Columbia University

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY
Tuesday Evening, October 4, at 8:00 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Cases from the University and Bellevue Clinic
 - b. Miscellaneous cases
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

Examination of cases is limited to members and their invited guests.

SECTION OF SURGERY

Friday Evening, October 7, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a.
 1. Atrophy of the head of the femur following intertrochanteric fracture. Persistent adduction deformity. Fusion of hip joint. End result one year
 2. Acute pancreatitis in a woman. Three operations with final cholecystectomy. Result after eighteen months
 3. Case of "so-called" cyst of external semilunar cartilage of knee joint. Operation and result after two years
 4. Traumatic rupture of spleen. Operation and result after four months, Nelson W. Cornell
 - b.
 1. Osteomyelitis of left femur with multiple bone foci
 2. Burns of left arm with a double pedicle graft for contracture of the elbow
 3. Multiple gun shot wounds of the abdomen, Margaret Stanley-Brown
 - c.
 1. Billroth 1 resection of stomach for carcinoma
 2. Billroth 2 resection of stomach in two stages for pyloric tumor
 3. Polya-Balfour resection of stomach for carcinoma, Edward J. Donovan

III. PAPER OF THE EVENING

Return of gastric acidity after subtotal gastrectomy and double vagotomy, B. N. Berg; P. F. Shapiro (by invitation)
Discussion, Allen O. Whipple, DeWitt Stetten, Frederic W. Bancroft

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Report of Nominating Committee:

For Secretary, Ralph Colp to succeed William F. Cunningham, resigned

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, October 11, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. The histopathology of two angiomas of the brain, Samuel Brock; Abner Wolf (by invitation) (20 minutes)
- b. Experimental toxic encephalomyelopathy (diffuse sclerosis), Armando Ferraro (by invitation) (30 minutes)
- c. Clinical and pathological notes in two unusual cases of tumor at the base of the brain, E. D. Friedman; Lewis D. Stevenson (20 minutes)
- d. Pericapillary encephalorrhagia following the administration of arsphenamine (so-called Salvarsan encephalitis), Joseph H. Globus; Sol. W. Ginsburg (20 minutes)

III. DISCUSSION

Charles Davison, Samuel T. Orton, Richard M. Brickner, Israel Strauss, Foster Kennedy

IV. EXECUTIVE SESSION

SECTION OF PEDIATRICS

The Section met in Boston on Saturday, October 15, in conjunction with the New England Pediatric Society and the Philadelphia Pediatric Society.

CHANGE IN DATES OF MEETINGS

The October meeting of the *Harvey Society* was held on Thursday, October 13, at 8:30 o'clock, instead of Thursday, October 20, as announced in the first October folder.

Professor Julius Bauer of Vienna delivered the first Harvey lecture of the year on the subject, "The Constitutional Principle in Clinical Medicine."

The October meeting of the *New York Pathological Society* was held on Wednesday, October 12, at 8:30 o'clock, instead of Thursday, October 13, as announced in the folder.

At this meeting Professor Bauer delivered the Middleton Goldsmith Lecture on the subject, "Genetics in Cancer."

SECTION OF OPHTHALMOLOGY

Monday Evening, October 17, at 8:30 o'clock

ORDER

Program arranged in conjunction with the
FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

1. Tumors of the brain, Charles A. Elsberg
2. Tumors affecting the optic chiasm and optic tract, Joseph H. Globus
3. Tumors of the eye and optic nerve, W. Gordon M. Byers, McGill University

SECTION OF MEDICINE

Tuesday Evening, October 18, at 8:30 o'clock

ORDER

Program arranged in conjunction with the
FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

Tumors of the lung, pleura and mediastinum:

1. Medical aspects, James Alexander Miller
2. Surgical aspects, George J. Heuer, Cornell University

SECTION OF GENITO-URINARY SURGERY
Wednesday Evening, October 19, at 8:30 o'clock

ORDER

Program arranged in conjunction with the
FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

1. Diagnosis and management of bladder tumors, Edwin Beer
2. A consideration of the malignant prostate and associated obstructive manifestations, Joseph F. McCarthy

SECTION OF ORTHOPEDIC SURGERY
Friday Evening, October 21, at 8:30 o'clock

ORDER

Program arranged in conjunction with the
FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

1. Tumors of the spinal cord, Byron Stookey
tumors of the nerves, Dean Lewis, Johns Hopkins University
Monday Evening, October 24, at 8:30 o'clock

ORDER

Program arranged under the auspices of
THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK

PAPERS OF THE EVENING

- importance of statistics in cancer control, Louis I. Dublin, Ph.D., Metropolitan Life Insurance Company
2. The factors constituting malignancy in tumors, James Ewing
3. Summary of radiologic treatment of tumors with special reference to malignant diseases, Geo. Edward Pfahler, Graduate School of Medicine, University of Pennsylvania

SECTION OF OBSTETRICS AND GYNECOLOGY
Tuesday Evening, October 25, at 8:30 o'clock

ORDER

Program arranged in conjunction with the
FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

1. Tumors complicating pregnancy, Benjamin P. Watson
2. Myomata and adenomyomata of the uterus, Thomas S. Cullen, Johns Hopkins University

The treatment of cancer of the uterus, George Gray Ward
Wednesday Evening, October 26, at 8:30 o'clock

ORDER

FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

1. Relations of the mouth and tongue, Carl Eggers

2. Tumors of the stomach, Donald C. Balfour, Mayo Clinic
- 3 Tumors of the colon and rectum, Daniel F. Jones, Harvard Medical School

Thursday Evening, October 27, at 8:30 o'clock

ORDER

FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

1. THE BULKLEY LECTURE:

Consecutive pathological and clinical events in cancer, Harrison S. Martland

2. Tumors of the bones and allied structures:

Surgical aspects, James M. Hitzrot

Radiological aspects, R. E. Herendeen

SECTION OF OTOLARYNGOLOGY

Friday Evening, October 28, at 8:30 o'clock

ORDER

Program arranged in conjunction with the

FIFTH ANNUAL GRADUATE FORTNIGHT

PAPERS OF THE EVENING

1. Cholesteatoma, Samuel J. Kopetzky

2. Tumors of the skin and mucous membranes, A. Benson Cannon

3. Hodgkin's Disease, Lloyd F. Craver

NEW YORK PATHOLOGICAL SOCIETY

The Middleton Goldsmith Lecture was delivered at the Academy by Professor Julius Bauer, Vienna, on Thursday evening, October 13, at 8:30 o'clock, on the subject, "Genetics in Cancer."

NEW YORK ROENTGEN SOCIETY

In affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Monday Evening, October 17, at 8:30 o'clock

ORDER

I. 8:30 to 9:00 o'clock

Demonstration and discussion of interesting cases

II. 9:00 o'clock

CLINICAL MEETING

Each member is urged to bring films of at least one case in which the diagnosis has been proved by operation, autopsy or therapeutic response

III. EXECUTIVE SESSION

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday, October 19, at 8:15 o'clock

ORDER

1. Combined effects of drugs and electrical excitation of cortical motor area in cats, H. C. Coombs

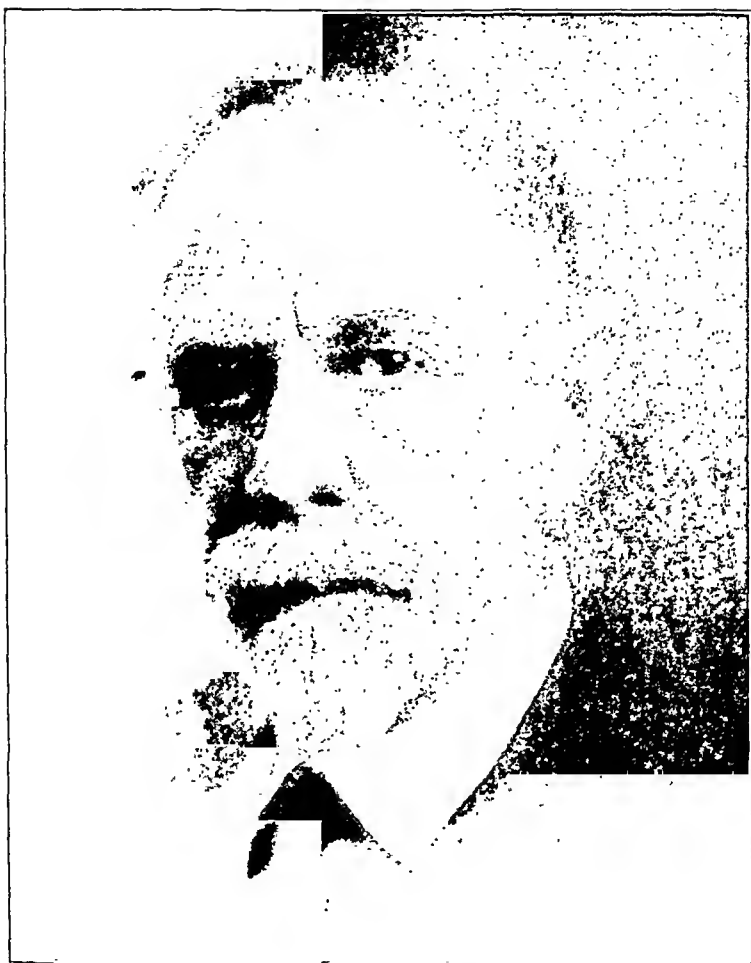
2. Buffer influence upon response of striated muscle to caffeine stimulation in fatigue studies, R. H. Cheney
Introduced by E. Ponder
3. Tobacco sensitiveness in thrombo-angiitis obliterans, J. Harkavy, S. Silbert, S. Hebald
Introduced by G. Baehr
4. Placental transmission of alimentary anaphylaxis, B. Ratner
5. Occurrence of rough pneumococci in lungs of patients with lobar pneumonia, G. S. Shibley, E. S. Rogers
6. Agglutination of streptococcus hemolyticus by rheumatoid arthritis sera: thermal characteristics of the reaction, M. Olmstead, M. H. Dawson
7. Effect of anterior-pituitary on production of red pigment in salamander *pseudotriton ruber ruber* (soninni), G. K. Noble, L. B. Richards
8. Typhoid agglutinins as influenced by the conditioned reflex in man, N. Kopeloff, M. E. Rancy, M. F. Upton, L. M. Kopeloff
9. Mechanism of bacteriophage action in staphylococcus bacteremia, W. J. MacNeal, F. C. Frisbee, A. E. Slavkin

FELLOWS ELECTED OCTOBER 20, 1932

Jackson A. Seward	121 East 60 Street
Willard C. Rappleye	630 West 168 Street
Joseph Tencenbaum	2 East 77 Street
Gregory Zilboorg	28 West 51 Street
Maurice J. Lewi	45 West 81 Street
Smiley Blanton	115 East 61 Street

CANDIDATES RECOMMENDED FOR ELECTION TO ASSOCIATE FELLOWSHIP ARE:

Lester R. Cahn, D.D.S.	94 Park Avenue
Morton C. Kahn, Ph.D.	Cornell Univ. Medical College
Abraham J. Goldforb, Ph.D.	College of the City of N. Y.
Carney Landis, Ph.D.	722 W. 168 Street



RUSSELL A. HIBBS
1869-1932

OBITUARY OF RUSSELL A. HIBBS

In the death of Dr. Russell A. Hibbs the art of surgery has lost a great leader, who in an especially difficult field opened pathways that have led to progress in directions hitherto held to be impassable.

Born in Birdsville, Kentucky, September 1, 1869, Dr. Hibbs attended Vanderbilt University and in 1890 was graduated from the medical school of the University of Louisville. After practising in Texas he came to this city in 1893 as an intern at Polyclinic Hospital. The next year he was appointed resident surgeon at the Orthopedic Dispensary and Hospital.

Coming to New York unknown and without influence, six years later, at the early age of 30, his ability had made him surgeon-in-chief of the New York Orthopaedic Hospital, a post he was to hold until his death. His inventive genius ranged the whole field of orthopedics, and his international reputation rests on many contributions covering a wide variety of subjects. Notable among these are his improvements in the treatment of tuberculosis of the joints, his method of treating diseases and injuries of the spine by the operation of spinal fusion, and his operations on the hip, knee, ankle and other joints.

He was deeply interested in the problems of medical education, and during his many years as professor of Orthopedic Surgery in the College of Physicians and Surgeons of Columbia University strove constantly to impress on his students his high conception of the medical calling. Through his instrumentality the Annie C. Kane Fund established fellowships enabling young doctors to continue their training during the first years after finishing internship at the New York Orthopaedic Hospital. Giving unstintingly of his time to the needy, he was especially concerned with the care of children, and as president of Hope Farm directed a community home for children at Millbrook. His major activities, however, centred about the New York Orthopaedic Dispensary and Hospital, the development and man-

agement of which formed the chief interest of his professional life. He was as great an administrator as he was a surgeon, and the magnificent new buildings of the Hospital, completed in 1916 and since enlarged, in planning and organization are largely his creation and form an enduring monument to his memory.

Dr. Hibbs died in New York, September 16, 1932. He was elected a Fellow of the Academy April 6, 1899. He was a member of the American Medical Association, American College of Surgeons, American Orthopedic Association and consulting orthopedic surgeon to a number of hospitals.

KARL VOGEL.

OBITUARY OF M. ALLEN STARR

Dr. M. Allen Starr, one of America's most distinguished neurologists and teachers, died in Marienbad, Germany, September 4, 1932. His family originally came from Middlebury, Vermont, but he was born in Brooklyn, May 16, 1854. Soon after his birth his family removed to Orange, N. J., where he had his early education in a private school. It is always interesting to know what determines an individual to follow the course which has led to eminence and distinction in his chosen calling and Dr. Starr has left some typewritten reminiscences of his early life which have a bearing on this. He felt as most people now do that certain personalities in youth have an immense influence on the future of their pupils, and he speaks feelingly of the stimulation he gained from the Rev. F. A. Adams who taught him Latin and Greek in the Orange School in an enlightened and creative way, and of his years at Princeton under the inspired teaching of Prof. Packard in Latin, Prof. Cyrus Brackett in Physics and the President of Princeton, James McCosh who made Philosophy and Psychology live in the minds of all so fortunate as to hear him.

Dr. Starr received the degree at Princeton of B. A. in 1876, M. A. in 1879, Ph.D. in 1884 and LL.D. in 1899.

It was in 1875 that the first investigations were being made showing the connection of mental processes with brain function. Fritsch and Hitzig in Berlin and Ferrier in London had just published the results of their physiological studies of the brain cortex, had established the relation of certain parts of the brain to movements of the body, had located the centres for motion of the head, arms and legs, and had demonstrated a relationship between certain parts of the brain and the faculty of speech. All this was presented to the students at that time by President McCosh in a most illuminating way. This new development in studies of the brain made a great impression on Dr. Starr, but when he went abroad after graduation from Princeton, he had a divided allegiance, for he had been promised a chair of history in which he also took great interest, if he would devote himself to that field. So in Europe he took courses in Berlin with Mommsen in Roman, and with Curtius in Greek history. But the lure of the other drive led him also to take lectures on physics by Helmholtz and to study the work of Wundt on mind and brain. These latter proved more attractive than dry history, so that on his return to New York after a year abroad he matriculated at the College of Physicians and Surgeons, taking the M.D. degree there in 1880. Here too he found the personality of certain professors arousing enthusiasm over and above all others, such as Alonzo Clark, Gaillard Thomas, Robert Sands and James McLean. Then came two years in Bellevue Hospital after which he again went abroad, this time with only one end in view, to Heidelberg with Erb and Schultze the foremost German neurologists of the day, and to Meynert and Nothnagel in Vienna. Nothnagel's lectures all that winter were on the subject of localization of function in the brain and spinal cord. After that he went to Paris for a course of study with Charcot.

On his return to New York in 1882 he found no labora-

tory where he could continue his microscopic work on the nervous system so established one in his own house to which students began to come for instruction. In 1884 he published an essay on the sensory tract in the nervous system and this was awarded the Alumni Association Prize of the College of Physicians and Surgeons, leading to his appointment as Professor of Anatomy and Physiology of the Nervous System at the New York Polyclinic and two years later as Professor of Nervous Diseases, until 1889 when he resigned to take the chair of Nervous Diseases in the College of Physicians and Surgeons, Columbia University, vacated by Dr. E. C. Seguin. He held this position until 1917 when he became emeritus. In 1905 Columbia University gave him the degree of Sc.D. During these fruitful years he was made consulting neurologist to the Presbyterian Hospital, St. Vincent's, St. Mary's, St. Johns at Yonkers, the Plainfield Hospital and the Westchester Hospital at Mt. Kisco.

He was President of the American Neurological Association in 1896, of the New York Neurological Society in 1894-97, and Vice-President of the Academy of Medicine 1903-6 and was foreign member of neurological societies in London, Paris, Berlin and Vienna.

Besides various papers printed in *Brain*, the *New York Medical Record*, *Reference Handbook of the Medical Sciences*, *Lea and Co's System of Medicine*, *Princeton Review* and *Popular Science Monthly*, Dr. Starr published a number of books as follows:

- Familiar Forms of Nervous Disease by himself and assistants at the Vanderbilt Clinic 1890
- Lectures on Nervous Diseases 1900
- Lectures on Diseases of the Mind 1902
- Brain Surgery 1893
- Atlas of Nerve Cells 1896
- Organic Nervous Diseases 1903
- Organic and Functional Diseases of the Nervous System 1907 (4th edition 1913)

It is thus seen that he was one of the foremost American pioneers in neurology at almost the beginning of this specialty. There had been a few before him such as Weir Mitchell, W. A. Hammond, Beard and two or three others, most of whom were still living when he gave new impetus to the study of diseases of the nervous system. He contributed much to our knowledge of conditions novel then but familiar now, such as multiple neuritis, poliomyelitis, acromegaly, syringomyelia, multiple sclerosis, Grave's disease, myxœdema and cretinism, the aphasias, apraxia, and tumors of the brain and spinal cord.

The first operation for tumor of the brain in this country was in 1887 by Seguin and Weir. In 1893 only fifty cases in all literature of successful removal of tumor of the brain could be collected by Dr. Starr, while in 1930 Dr. Harvey Cushing was able to report two thousand of his own, and Dr. Starr stated shortly before he died that probably ten thousand cases had been operated to date, compared with the fifty cases in 1893.

Dr. Starr felt for his chosen department of medicine an intense interest, and his enthusiasm in his work communicated itself to his students and to all the associates with him in his clinical and professional work. His lectures were always thronged not only by the college students but by practitioners who came to learn of the new advance in neurology. He had a great gift in the matter of orderly, masterly and inspiring presentation of any subject that came up for discussion or lectures. His ambidexterity in drawing sections of brain or cord or patterns of cerebral lesions on the blackboard as he talked elicited often especial applause. He was one of the most kindly of men, generous and helpful to all of his assistants, students and friends, and everyone gave him an unusual meed of admiration and loyalty.

FREDERICK PETERSON.

DEATHS OF FELLOWS OF THE ACADEMY

EMANUEL DAVID NEWMAN, M.D., 81 New Street, Newark, N. J.; graduated in medicine from the College of Physicians and Surgeons, New York City in 1884; elected a Fellow of the Academy February 6, 1908; died, November 4, 1932. Dr. Newman was Secretary of the Academy of Medicine of Northern New Jersey for sixteen years, a Fellow of the American Medical Association, a member of the New Jersey State Medical Society and the Essex County Medical Society, and was connected with a number of hospitals in New Jersey and New York.

RICHARD JOHN ERNST SCOTT, M.D., 494 Fourth Street, Brooklyn, N. Y., graduated in medicine from Cornell University Medical College, in 1899; elected a Fellow of the Academy October 7, 1915; died, October 24, 1932.

HERBERT GATZ WERTHEIMER, M.D., 200 Ninth Street, Pittsburgh, Pa.; graduated in medicine from the University of Pennsylvania, Philadelphia, in 1901; elected a Fellow of the Academy November 3, 1921; died October 25, 1932. Dr. Wertheimer was a Fellow of the American Medical Association, and a member of the Allegheny County Medical Society.



GROUP PURCHASE OF HOSPITAL CARE

E. H. L. CORWIN

The British experience with the so-called "contributory schemes" is extremely interesting and enlightening. For those of us who are not quite familiar with the provisions of the British Health Insurance Act, it would seem strange that in a country where compulsory insurance against the contingency of illness exists, there be a need for further arrangements to provide for hospitalization. In some countries the hospital is a part of the general play for the care of the insured sick, whether it be provided by law or by administrative procedure, but in Great Britain the treatment provided in case of illness is of a kind which can be properly undertaken by a general practitioner "of ordinary professional competence and skill." It does not provide for treatment requiring the facilities of a hospital.

The contributory hospital schemes of Great Britain provide a method of raising revenue for the voluntary hospitals through group purchase of hospital service. They owe their inception and development to the postwar economic conditions. The burdens of taxation, the disorganized trade of Great Britain following the War, and the growing difficulties of providing employment, have impoverished the British population, and the maintenance of social insurance has placed enormous responsibilities on the Government exchequer. The wealthy families became less able to meet the growing demands on the part of various charitable endeavors and the situation of the voluntary hospitals in the beginning of the last decade in Great Britain became so desperate that a special Committee was appointed by the Government early in 1921 to inquire into the situation. This Special Committee was presided over by the Viscount Cave and it was requested "to consider the present financial condition of voluntary hospitals and to make recommendations as to any action which should be taken to assist them." The Committee reported under date of May 21.

1921. To the fundamental question as to whether or not the voluntary hospitals should be encouraged to continue, or whether it would not be more desirable that they should be turned over to the State and be henceforth maintained by taxation, the unanimous answer of the Committee, expressed in no uncertain terms, was to the effect that "the money loss to the State would be a small matter compared with the injury which would be done to the welfare of the sick for whom the hospitals are provided, the training of the medical profession and the progress of medical research," if the voluntary hospital should be allowed to pass. "The voluntary hospital system, which is peculiar to the English-speaking peoples, is part of the heritage of our generation; and it would be lamentable if by our apathy or folly it were suffered to fall into ruin."

There are at present at least 270 hospital contributory schemes in Great Britain of varying size, and differing from each other in details of practice and privileges accorded to their contributors. They have an enrolled membership of over six million people, not including dependents of contributors. They contribute annually into the treasury of the voluntary hospitals two and a half million pounds, or from 60% to 70% of the entire income of the hospitals. A description of the principal features of any one of the successful plans will implement the purpose.

The essentials of the Merseyside Plan which is one of the most successful ones, are as follows:

1. All of the 22 voluntary hospitals of the four boroughs (Liverpool, Birkenhead, Bootle and Wallasey) have agreed to the plan, i.e., to pool their resources as a unit and to abstain from making individual appeals to the community for support;
2. The city authorities, the public assistance officers, organized labor, the medical profession, the churches, and the University, have all allied themselves with the hospitals in conducting a financial campaign for the maintenance of hospitals;

3. The industrial workers have consented to make weekly contributions toward the support of hospitals and toward their own protection in case of illness requiring hospitalization;
4. The employers of labor have agreed to deduct the voluntary contributions of their workmen and to turn them over to the Council plus their own contributions, the size of which varies;
5. The employees, as well as workmen, are represented on the Central Council as on its various committees; and
6. The Merseyside Council serves both as a community chest for the hospitals and as a quasi hospital insurance fund for the small contributors.

The Plan, as it has been worked out there, is only a few years old and is admittedly an experiment. The penny in the pound contribution was initiated simply because of its slogan value and the ease with which contributions could be calculated. It does not take into consideration the size of the family of the contributor. It bases the contribution in proportion to earnings of the individual rather than in proportion to the risk involved. There was not enough of a body of information in existence at the time it was started, to organize it on a strictly actuarial basis, and it might not have succeeded if it were organized in that way at first.

In return for his weekly contribution, the Fund guarantees to the contributor and his dependents the payment of hospital treatment, if and when needed, as well as auxiliary services, such as ambulance service, surgical appliances, extra nourishment, convalescent care, spa treatment and so on. Although the Council has practically succeeded in balancing the hospital budgets, it recognizes that the penny in a pound contribution is inadequate to meet the cost of hospitalization.

Under the Contributory Schemes there is no contract for

free medical service except that free medical service is provided up to the limit of existing hospital accomodation. In other words, the contributors realize that they cannot receive service if the hospitals are overcrowded at the time of their need, or if they should suffer from conditions unsuitable for hospitalization. In that event however, the Fund provides payment for treatment in a municipal hospital. These hospitals include the former Poor Law Hospitals, which, under an Act of Parliament of 1929, have been taken over by the municipalities, and are providing care for certain types of infectious and chronic maladies and for acutely ill patients who are destitute. A contributor to the Merseyside Fund, sent by a physician to a municipal hospital, is, by virtue of the arrangement made, free from financial investigation. Under the Merseyside Plan, and in some other communities, the wife of the contributor and his bona fide dependents, that is, those who are resident with him and wholly dependent upon his earnings, are entitled to full hospital benefits.

The point may be raised whether the pattern of organization and function of the British Contributory Schemes is applicable in this country. In view of the existing financial conditions in which many of our private hospitals find themselves, and in view of the growing conviction among the well-informed people in this country that some play of constructive provision for the care of the sick is needed, the progress made in Great Britain with the contributory schemes deserves thoughtful attention.

The three outstanding differences concerning hospitalization between the two countries should, however, be borne in mind:

1. In England the general city or county hospital is a matter of recent development. Hitherto, aside from the fever hospitals, the tuberculosis and mental disease hospitals, the care of the indigent sick was provided in Poor Law hospitals, which were not very desirable institutions. Hence the avidity of the working class for insurance which would safeguard against the Poor Law hospital.

2. The British National Health Insurance Act provides for medical care of the workman by physicians of ordinary or average professional capacity. It does not provide for the services of specialists or of hospitals. The insured person cannot resort to the hospital unless there is a definite occasion for hospitalization certified to by the panel physician. The voluntary hospital reserves its right of admission. Hence the insured person cannot very well abuse the privilege of hospital care under the contributory scheme.

3. In but a few of the voluntary British hospitals are there facilities for private or semi-private patients. Practically all patients in these hospitals are under the free care of the visiting and resident staff of the hospital.

In order to appraise properly the problem involved in group purchase of hospital insurance in a city like New York, it is important to bear in mind very clearly the following three questions:

- I. For what groups in the population is hospital insurance to be provided?
- II. How can the difficulties inherent in the situation be obviated or minimized, and
- III. What should the machinery through which this insurance should be set in motion, granting that it be feasible and practical?



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No. 12

ANNUAL GRADUATE FORTNIGHT TUMORS

October 17 to 28, 1932

SOME ASPECTS OF CANCER MORTALITY*

LOUIS I. DUBLIN, Ph.D.

Third Vice President and Statistician Metropolitan Life Insurance
Company, New York

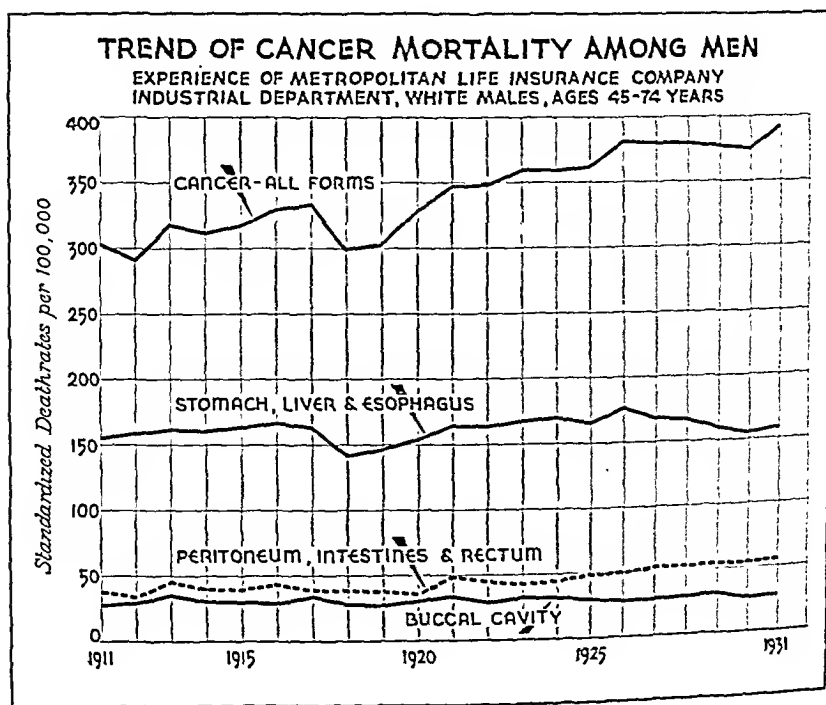
The outstanding fact in the complex we call the cancer problem is that the mortality from the disease, or shall I say from this group of diseases, is continuously increasing. I have put it dogmatically but I have no doubt at all as to the accuracy of this statement. There will be no time tonight to demonstrate the steps of the proof. I have done this in other places and the evidence is very full and clear. But I will say that this conclusion was arrived at after such fortuitous factors as the changes in the method of registering deaths from cancer, improved diagnosis, the increasing age of the population, the shifting racial and other characteristics of the population were each and all given due consideration and evaluated. In the consideration of cancer, we are confronted with a condition that is becoming more, rather than less, important in spite of the fact that medical and sanitary science are constantly advancing and are bringing an increasing number of other diseases under control.

For this particular evening, it has seemed desirable to present some of the high spots in our study of the cancer situation as we have conducted it at the statistical labora-

*Delivered before the joint meeting of The New York Academy of Medicine and the Medical Society of the County of New York, October 24, 1932.

tory of the Metropolitan Life Insurance Company. For more than twenty years, we have collected information from the mortality records of our millions of policyholders. We have cleared up incomplete statements of cause of death wherever possible through the cooperation of thousands of physicians; we have analyzed the facts concerning the age, sex, color, economic and social condition, occupation and other characteristics of the insured, hoping in this way to find clues which might aid the clinicians and pathologists in their study of the disease. In this brief paper, I will present a few vignettes which will summarize our findings on several aspects of the mortality from cancer.

Chart 1



I shall first consider the trend of cancer mortality among white men. Chart 1 shows the rates for a period of twenty-one years from 1911 to 1931, inclusive, for the more important sites of malignancy. The data relate to Industrial

policyholders of the Metropolitan Life Insurance Company, ages 45 to 74, because it is in these ages that the cancer problem is most important. You will observe that among white men past middle life, the deathrate for the composite, that is, all forms of cancer, has increased from about 300 deaths per hundred thousand in 1911 to very close to 400 at the present time, an increase of about one-third. The trend has been unmistakably upward. Between the years 1911 and 1917, the rate increased at the rate of nearly two per cent per annum; but since 1921, the annual rate of increase has been at an average of only one per cent. As in many other diseases, the deathrate for cancer declined very appreciably during the influenza period almost to the low point of 1912. It soon returned to its former level and since 1921 the rate has been steadily mounting even if at a slower pace than before the influenza outbreak.

Among men at these ages, cancer of the stomach, liver and esophagus constitutes the largest single group of malignant growths, with about 42 per cent of all cancer deaths in 1927-1931. Cancers affecting the peritoneum, intestines and rectum are next in importance, constituting about 14 per cent; those of the buccal cavity follow with seven per cent of all cancers. These are the three most important sites among men and together account for about two-thirds of the cancer mortality in white males at this time of life. The remaining one-third is made up of cancers of the kidney and bladder (6.4 per cent of total); prostate (6.4 per cent); larynx, lung, pleura (6.1 per cent) and other organs or parts (17.2 per cent). These data are shown on chart 3.

The deathrate from cancer of the stomach, liver and esophagus, declined between 1926 and 1930 but rose in 1931. For this type of cancer, the rate for recent years is practically identical with the rate in the period 1911-1915. On the other hand, the mortality for cancers of the peritoneum, intestines and rectum has significantly increased from a rate of 39 in 1911-1915 to nearly 53 in 1926-1930. That for buccal cancer has remained about the

same. The largest increase has occurred among a large group of minor subdivisions of cancer such as those of the larynx, lungs, pleura, prostate, kidney and bladder, and the cancers of certain other organs and parts. Individually, these groups are small but, in the aggregate, they now account for more than one-third of the total cancer death-rate in men and there has undoubtedly been a sharp increase in the number of deaths ascribed to them.

One point I should make clear. In this chart as in the ones that follow, we have been careful to keep the factor of age constant. Not only do the annual figures correspond to the age period 45 to 74 years but the composition of the individuals who make up this aggregate has been kept the same throughout the period. In other words, no part of the increase that we are talking about can in any way be ascribed to a changing age distribution or to an increasing average age of the persons exposed. These figures have all been adjusted to cover this point.

Chart 2

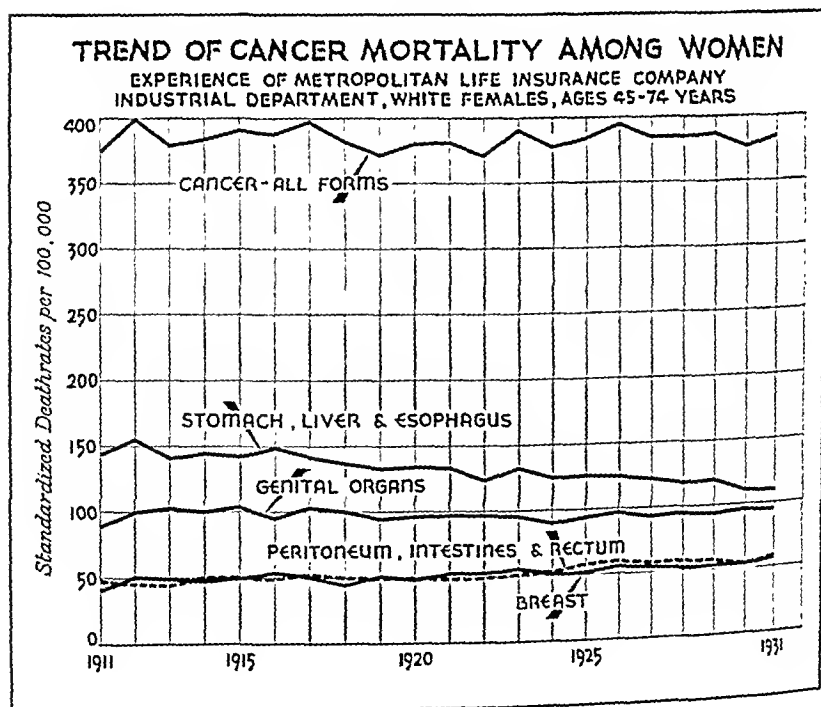


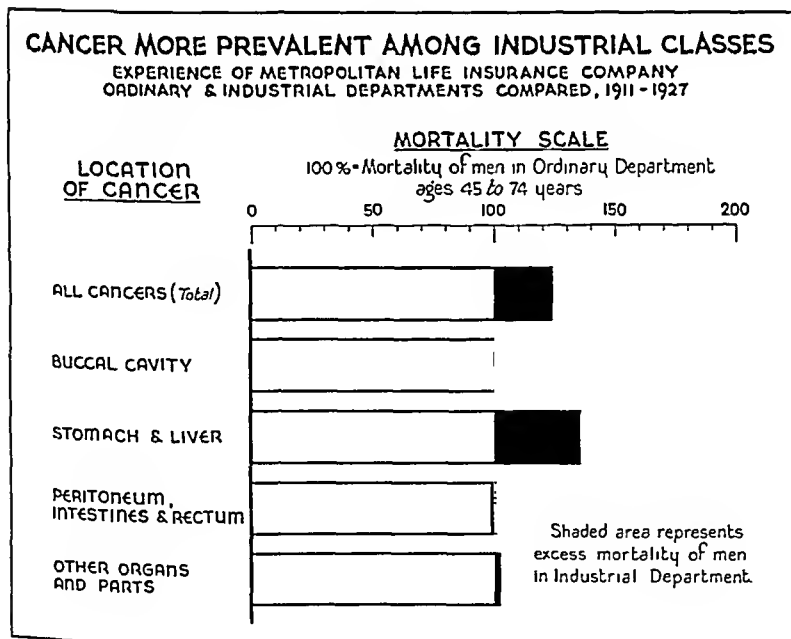
Chart 2 relates to a similar group of women, ages 45 to 74. In 1911, the rate for all forms of cancer in this group was about 375 per hundred thousand policyholders. The rate has fluctuated from year to year since, but the general trend for cancer deaths among white women, ages 45 to 74, has been practically stationary. In the period 1911-1915 the rate was 385.3; in 1926-1930 it was 385.6. During the past ten years the average annual rise in the mortality rate has amounted to only one-tenth of one per cent. Cancer mortality formerly was considerably higher for women than for men, but due to the more rapid rate of rise among males the deathrates from cancer are now practically the same for both sexes.

As among men, cancers of the stomach and liver constitute the largest group of malignant growths, accounting for 30 per cent of all cancer deaths in 1927-1931. Those of the female genital organs are next in importance and account for 25 per cent of all deaths. The group of cancers affecting the intestines, the peritoneum and rectum is third, with 15 per cent and cancers of the breast constitute a close fourth, with 14 per cent of all the deaths. These four important groups, combined, account for 84 per cent of all deaths from cancer among white females.

Deaths from cancer of the stomach and liver among females have been declining at an average of 1.4 per cent annually and the rate for 1931 was the lowest in 21 years. Those from cancer of the female genital organs have declined in the past two decades at the rate of three-tenths of one per cent annually, on the average. Cancers of peritoneum, intestines and rectum in females have shown an increased mortality but it has amounted to only 1.2 per cent annually, on the average, or only two-thirds as much as the rate of rise shown for men. Deaths from cancer of the breast, which is practically limited to females, have occurred more frequently in recent years than formerly. The 1926-1930 deathrate was 53.9 per 100,000 females as compared with 47.4 in the five years 1911-1915.

nomic or social condition of deceased persons are very difficult to obtain for the general population. In the Metropolitan Life Insurance Company, however, we have a ready means of comparison in this regard. We have two departments, the Ordinary and the Industrial, both including millions of insured. The men insured in the Ordinary Department may be broadly described as composed of professional and mercantile men and higher salaried artisans. They constitute a distinctively higher economic level of the population than do the Industrial policyholders. The men in the latter group are, for the most part, urban wage earners. The records of the Company compiled in much the same way, make it possible, therefore, to compare the rates of mortality from cancer in these two groups.

Chart 4



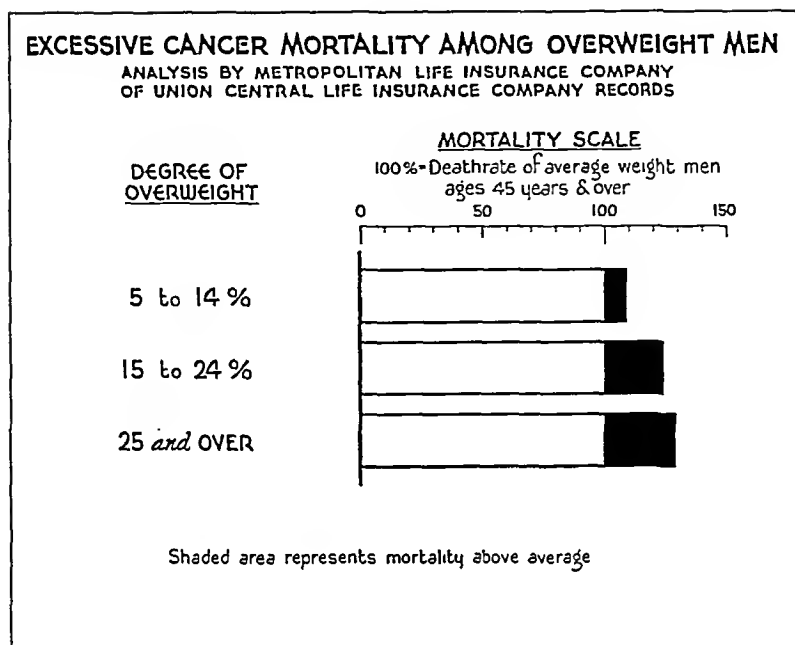
In the first place, the mortality rate from all cancers is higher among the Industrial wage earners than among the Ordinary policyholders. For the entire period between

1911 and 1927 the excess among Industrial males at the ages of 45 to 74 years was about 25 per cent for all types of cancer combined. The deathrate from cancer of the buccal cavity is found to be about twice as high among Industrial policyholders as it is among men in better economic circumstances. That from cancers of the stomach, liver, and esophagus is found to be about one-third higher in the Industrial class. On the other hand, the group of cancers of the peritoneum, intestines and rectum as well as cancers of other organs and parts show little difference as between the two economic levels. Again we must be careful to note that the comparisons have been made for men of the same age groups. None of these differences can be ascribed to the age composition of the two classes.

In presenting this comparison, I have no idea of giving an explanation for this strange phenomenon. I present it to you in the hope that the figures may arouse your interest and stimulate further discussion and inquiry. I may say that these data confirm studies which we made fifteen years ago and there has been no suggestion of any change since then. The Registrar-General of England and Wales in comparing the mortality from cancers in various social classes, found exactly the same condition that we have.

Finally, I show in Chart 5 the relation between the mortality from cancer and the factor of overweight. The possibility that a close relationship exists between overweight and cancer is not new. Insurance records have for many years indicated that overweight persons past middle life succumb more readily to cancer than do men of average weight. Cancer in this regard behaves very much like such other conditions as diabetes, heart disease, cerebral hemorrhage and the degenerative diseases generally. In this particular chart, we show what happens to the cancer rate as the amount of overweight increases. In obtaining our results, allowance has been made for differences in age distribution between the several weight classes. In the first class are the moderate overweights, those whose excess is between five and fourteen per cent. We found that men

Chart 5



over age 45 whose overweight was moderate, showed a nine per cent greater mortality from cancer than did men of average weight of the same ages. When the excess overweight was between fifteen and twenty-four per cent, then the cancer deathrate was 24 per cent higher than for men of average weight and, finally, we found that men 25 and more per cent overweight, that is, the extremely heavy men, suffered an excess mortality from cancer of about 30 per cent as compared with that of men of average weight. Here again we are confronted with a set of facts which should prove highly suggestive to those who are at work on the relation of metabolic changes to the development of cancer. Our findings are, so far as I can see, entirely consistent with the more recent work, both here and abroad, which indicates that the cancer processes may well be a reflex of internal maladjustments of which overweight is one of the outward signs.

In this brief presentation I have definitely limited myself to a consideration of the cancers of white men and women. It is, however, opportune to call attention to the fact that very marked changes are taking place in the incidence of cancer among colored people. Twenty years ago, cancer deathrates were much lower among negroes than among whites. For example, in 1911 white men, ages 45 to 74 years, experienced a rate of 304 deaths from cancer per 100,000 as contrasted with a rate of 151 for colored men of similar ages. That is to say, the rate for colored was only one-half that for whites. Cancer mortality among the colored has been increasing more rapidly than among white persons. Cancers of the stomach and liver in white males in the past twenty years increased two-tenths of one per cent annually, whereas among the colored, the increase in the deathrate amounted to two per cent annually. For cancers of the peritoneum, intestines, rectum in the same twenty years, the increase was two per cent annually for white males as against nearly four per cent for colored.

White females in 1911 showed a much higher mortality rate from cancer than did the colored, but since that time, the mortality among colored women has been increasing at a much more rapid rate than among white. Among the latter, deaths from cancer of the stomach and liver actually showed a decrease of 1.4 per cent annually over the past twenty years; in colored women, there was an increase of four-tenths of one per cent annually. Mortality from cancers of the peritoneum, intestines, rectum also has increased more rapidly among colored women than among white. The average rise in this cancer group amounted to 1.2 per cent annually, but among colored females it was 1.7 per cent annually. Cancers of the female genital organs showed a decline among white women of three-tenths of one per cent annually, but an increase of six-tenths of one per cent among colored. Cancer of the breast shows a different picture. The rate for the colored declined seven-tenths of one per cent annually, but for the white showed an increase of eight-tenths of one per cent from this cause.

The above discussion has been limited to the period between 1911 and 1931. It will be of some interest, I know, to give a few items from the records of 1931 and 1932, even if they are still in crude form and uncorrected for changes in age composition, etc. There has been an unprecedented rise in the mortality from cancer during the last two years. Last year, the rise among the Industrial policyholders of the Metropolitan Life Insurance Company amounted to 7.4 per cent; this year, up to the end of September, there has been a further increase of 9.6 per cent over the corresponding figures of last year. Instead of the persistent, but slow rise we have experienced for years, we now have this sharp acceleration, with the probability that by the end of 1932 we shall find cancer mortality to have increased three-fourths as much in two years as it did in all the preceding twelve years, back to 1919.

I do not know whether the cancer mortality rate is rising as sharply among the population at large, as it is among insured wage earners and their dependents. Unfortunately, only fragmentary and inconclusive mortality data are, as yet, available from official sources. Nevertheless, the few reports that have been received strongly suggest that cancer deaths increased both last year and this in the country at large, to an extent that has not been heretofore observed in any single year—although the rise has not been as marked as among the working classes.

The weight of the evidence is that the cancer death toll is now increasing at a rapid rate. It has been suggested that the unusual increase, among Metropolitan Industrial policyholders, may have been due, in part, to a change during 1931 and 1932 in the relative age distribution of lives exposed to risk, whereby a considerably larger proportion of the policyholders is now in those age ranges where cancer mortality is the highest. This thesis is not tenable, however. The facts of age distribution among our policyholders show no marked shift. Again, when the 1930 and 1931 cancer deathrates are standardized for age, a large increase in the rate is found. Furthermore, no such marked

increase in the deathrate has been observed in the mortality from cardiac disease, chronic nephritis and cerebral hemorrhage, all of which, like cancer, are diseases of the older ages.

We can only conclude that some forces have been at work since the beginning of 1931 to cause a marked acceleration in the number of deaths reported from cancer. It is by no means assured, as yet, that the actual increase in 1931 and 1932 has been as sharp as our figures indicate. There is always the possibility that part of the rise resulted from more accurate diagnosis. An eminent authority on cancer believes this to be true. Many more cases are undoubtedly being discovered through laboratory findings, operative procedures and autopsies, which are being made more often now than ever before. But there is, of course, the possibility that over and above these factors, we are confronted with some influence that is increasing the true incidence of cancer. Time will be required to answer this question.

In closing, may I say that it has been possible in this presentation to give only a summary of some of our statistical investigations into cancer mortality. The Metropolitan Life Insurance Company is continually collecting mortality data on this subject and has very detailed statistics on various phases of the cancer problem. Some have been published, others are in manuscript. The statistics are available to any physician who may have an interest in them.

THE FACTORS CONSTITUTING MALIGNANCY IN CANCER*

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(Abstract)

The term "cancer" includes many different diseases which differ widely in their effects on the body. General statements regarding malignancy in cancer are therefore of very limited significance. Each type of cancer must be considered by itself. Nevertheless, all of them tend to pursue a fatal course and many of them in late stages produce conditions which in many respects are identical.

There are several erroneous conceptions regarding advanced cancer which have been widely entertained and which should be corrected.

a) Well nourished cancer tissue is usually nearly homogeneous with the normal body tissues and does not exert any deleterious effect on the body. The old idea of a toxic action of cancer caused by a specific cancer toxin acting on the body as a whole and producing especially a toxic destruction of normal tissue is a misconception. There is no such toxic action. Many subjects in whom there is a large primary tumor and widespread metastasis do not show any definite disturbances in metabolism, or loss of weight, and often the patients state that they feel well.

There are no specific chemical substances in cancer tissue which differ from those of normal tissues, and therefore no general serum test for cancer can be expected.

b) Acid intoxication occurs in a few types of cancer as of stomach and liver but is always due to secondary complications and not to the cancer process as such. Warburg has shown that cancer tissue produces large amounts of lactic acid but there is no definite evidence that this acid

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produces any general disturbance in the body. Demineralization may occur in some cases but does not affect the general condition of the body.

c) Alkalosis has been recently heralded as the underlying condition leading to cancer, determining its hereditary qualities, and dominating its course. These observations lack any substantial support.

On the positive side, one must point to anemia as perhaps the most frequent result of a malignant tumor and one which often dominates the whole clinical picture. It is due to a variety of causes, such as hemorrhage, hemolysis, infection, underfeeding, and mental depression. In many cases the anemia is out of proportion to all other factors and may even mask the presence of the cancer.

Infection of the tumor tissue, with fever and intoxication, is a very important cause of loss of health and of malignancy in tumors. It is often overlooked. Nearly all tumor tissues which are exposed to the air and most internal cancers of mucous membranes give positive bacterial cultures. In some statistical studies it has been calculated that infection was the cause of death in as high as 75 per cent of the cases. The varieties of bacteria isolated from cancer are numerous but certain strains of streptococci are most frequently observed. Many of these have figured as the cause of cancer, but all are probably secondary invaders.

Intoxication from degenerating products of tumor tissue is a common cause of malignant features in many large tumors, especially in sarcomas. It is therefore highly important to maintain the nutrition of tumor tissue as long as possible and to remove as promptly as possible any degenerating tissue.

Fever does not belong to the cancer process and is always the result of infection or intoxication.

Mechanical obstruction of vital organs is very often the first signal of malignancy in a tumor and the cause of

death in a great many. Esophagus, stomach, intestines, rectum, urinary passages, larynx, trachea, and bronchi are readily obstructed at certain stages of the growth, always with immediate disturbance in health and often with shortly fatal results. A few tumors grow so rapidly that the body tissues are deprived of nutriment and general loss of weight and emaciation occur.

The mental state is of extreme importance in the management of cancer cases in all stages. Long illness, loss of earning capacity, pain, deformity, bleeding, infection, loss of health and strength, the knowledge of the existence of a lethal disease, all tend to produce a condition of extreme mental depression and inanition which have a very bad effect on the course of the disease and often lead to a premature termination. Deforming operations followed by prompt recurrence, radiation sickness and other sequels of heavy and ill-advised radiation therapy, constitute a heavy penalty visited upon the cancer patient which magnify the dread of the disease entertained by the public. It is a wise plan never to tell a patient, if it is possible to avoid it, that he has cancer. It is also necessary to maintain the morale of patients to the very last degree by an attitude of optimism. Many patients go rapidly downhill from the moment they find that the physician has given up hope. The palliative effects of many cancer cures are mainly the result of the increased optimism which the new remedy engenders.

The soundest progress in cancer therapy will proceed along the lines of conservative efforts in the face of incurable disease, vigorous procedures in curable cases, replacement of radical measures by less serious procedures, and the cultivation of a reasonable optimism under all circumstances.

SUMMARY OF RESULTS THAT CAN BE OBTAINED BY IRRADIATION IN CANCER*

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The progressive increase in Cancer requires that every physician shall do everything in his power toward the prevention or cure of cancer. Even at present much can be done to prevent cancer, as I have indicated in a previous paper,¹ if everyone makes use of all the knowledge that is now available. This requires among other things that every physician be on the alert for the diagnosis of precancerous lesions, and that he help in the individual instruction of patients as to danger signals.

One of the first essentials in the instruction and care of patients for the prevention and cure of cancer is a knowledge of what can be accomplished by each method or means for the treatment of cancer. Your officers have therefore asked me to give you a summary of what can be accomplished by irradiation. You will understand, therefore, that my silence as to the great value of surgery is obligatory for want of time. I take it that you do not want to know just the general average of results that are being obtained, nor the results of poor judgment and bad technique, but rather the best that can be accomplished by those who have made a careful study of both cancer and the principles of radiology, and who have used the best known technique. It is also advisable that surgery should be considered from the same standpoint, and then it is clearly the duty of all who undertake the treatment of cancer to learn and apply the same principles and technique. This will lead to real progress.

In my opinion, the field for irradiation therapy will always be limited, especially in dealing with cancer of the

*Delivered before the joint meeting of The New York Academy of Medicine and the Medical Society of the County of New York, October 24, 1932.

¹Pfahler:—Can We Prevent Cancer?—*Monthly Bulletin* of the Department of Health of the City of Philadelphia, Jan.-Feb. 1932.

viscera, because of the difficulties in protecting the essential organs. Wherever irradiation is useful it is self-evident that a small localized area of disease will be more successfully treated than a large or widely scattered area. Until recently, for the most part, it was the advanced cases that have been referred for irradiation, and it was only by producing results on such cases that earlier ones have been treated and better results obtained. The summary which you request can probably be best made by discussing cancer affecting the various organs, in the order in which most has been accomplished by irradiation, as follows: Skin, Lip, Mouth, Uterus, Breast, Tonsil and Pharynx, Larynx, Lungs, Lymphatics, Bone, Brain, and Gastro-Intestinal Tract.

Cancer of the Skin in its early stages, while it still involves only the skin, can be cured in almost 100 per cent by a skilful combination of electrocoagulation and irradiation. It is true that this results in a slight scar, which in my opinion is of no significance. When the roentgen rays are used alone, it requires about four erythema doses. This however is safe to give if the lesion is small. This roentgen ray treatment will usually leave slight atrophy of the skin. When radium is used about four erythema doses will also be required, and often by this means the lesion can be eliminated without scar, especially if given in divided doses. *When an epithelioma has extended into the deeper tissues—cartilage, fascia, muscle, or bone, it is correspondingly difficult to get the patient well, and while the disease may be temporarily eliminated ultimate failure is a common result.*

Early, thorough and skilful treatment is therefore the keynote to success in the treatment of cancer of the skin as with cancer elsewhere in the body. If all the knowledge now available is utilized by both the laity and the profession, nearly all cancers of the skin should be prevented, and practically all can be cured. I have not failed in any case in which the disease had not invaded the deep tissues at the time when the patient first came. Statistics show

a variation of cures by means of irradiation of from 53 per cent (E. G. Williams) to 100 per cent (Dolloway). The variation is due to the extent of the disease at the time of treatment, and to the technique used. In unselected cases, the cures under skilful irradiation amount to 90 per cent (MacKee).

Cancer of the Lip is usually located at the junction of the skin and the mucous membrane or on the mucous membrane at its earliest stage, and it also has characteristics resembling each. I believe that it is generally preceded by a non-malignant lesion, such as a crust, wart, or fissure, or leukoplakia, and an epithelioma develops because these precancerous lesions have been neglected or improperly treated.

Dr. Vastine and I reported before the Radiological Section of the A. M. A. in 1931² on 253 cases of epithelioma of the lip taken from my private records extending from 1902 to 1930, during a period of twenty-eight years. There were 140 cases in which the primary lesion was not more than 1.5 cm. in diameter, and in this group we had only one failure, or 99 per cent of apparently permanent recoveries of from one (now two) to twenty-eight years. In the one case that terminated fatally, through a misunderstanding the patient did not receive our routine high voltage irradiation of the mental, sub-mental and sub-maxillary lymphatics. This patient had the local lesion destroyed, and the area remained well, but the patient returned in about a year with fixed, adherent, infiltrating lymph nodes which we were not able to cure, and he died, September 5, 1923, nearly four years after first coming under our care. We believe that this death could have been prevented by our routine associated prophylactic irradiation, if it had been given at the beginning.

We realize that many and possibly most of this group of cases had no lymphatic invasion, and we know that palpable lymph nodes do not always mean metastatic car-

²Pfahler and Vastine:—*J. A. M. A.*, Jan 2, 1932, Vol. 98, pp. 32-35.

cinoma; but the facts that metastasis developed in this single case in which our prophylactic irradiation had been omitted, and that metastases are common after a simple excision of the local lesion or after local destruction by cancer pastes in cases in which no prophylactic irradiation has been given, and that no harm is done by the irradiation, have convinced us of the value of prophylactic irradiation to the associated lymphatics as a routine procedure.

We have treated fifty-eight primary cases in which the local lesion was more than 1.5 cm. in diameter but in which there were still no palpable nodes at the time when the patient came for treatment. Recovery occurred in 83 per cent of the fifty-eight cases. Some of these cases were far advanced.

Our records show *thirty-nine primary cases in which there were palpable lymph nodes*. Recovery occurred in 56 per cent. This shows only a little more than half as many recoveries as we obtained in the early lesions with no palpable lymph nodes and it shows the importance of early and thorough treatment. Even 56 per cent is higher than is obtained by extensive surgical dissections.

We have treated seventy patients with cancer of the lip who were sent to us because of *recurrent lesions* or because of lesions that had been incompletely removed by excision or electrocoagulation (thirty cases), or by chemical destruction (twenty-seven cases), or which had been unsuccessfully treated by x-rays or radium (thirteen cases). In this group of recurrent cases, we have obtained only 71 per cent of recoveries, while in the total of all other cases we obtained 95.5 per cent. The recurrent cases are always more difficult to manage and require much more detailed work with a greater chance of ultimate failure.

We believe that if patients understand that they can be treated for cancer of the lip in the early stage and while the lesion is small, without undergoing an extensive operation, they will apply to the physician earlier for treat-

ment while they can be cured. In the advanced stage and when there are extensive metastases cancer of the lip is a very serious matter.

TABLE NO. 1

RESULTS IN TWO HUNDRED AND FIFTY-THREE CASES OF EPITHELIOMA OF THE LIP

Females 32 = 12%	Male 238 = 88%	Total 270
Treatment carried to a conclusion		253
Advanced and hopeless cases in which treatment was not advised		17
	Total	270

Classification According to Results of Treatment

	Cases	
Living and free from evidence of disease (Counting all cases).	212 =	84%
Dead from carcinoma	29 =	11%
Well when last seen—not traceable now	12 =	5%
	Total	253 = 100%
Omitting the 12 cases not traceable, but probably well—Recovery..	88%	
	Dead.....	12%

Classification According to Extent of Disease

	Recoveries	Dead from Cancer	Total
Local lesion, 1.5 cm. or less in diameter....	139 = 99%	1 = 1%	140
Local lesion, extensive, i.e., more than 1.5 cm. in diameter	48 = 83%	10 = 17%	58
Cases in which there were palpable lymph nodes	22 = 56%	17 = 41%	39
Postoperative irradiation given before recurrence	3 = 75%	1 = 25%	4
	Total	29	211
	Recoveries	Dead from Cancer	Total
Cases with no palpable lymph nodes	187 = 94.4%	11 = 5.6%	198
Cases with palpable lymph nodes	22 = 56%	17 = 41%	39

Cancer of the Mouth—We believe that most cancers of the mouth can be prevented by eliminating all forms of irritation, such as come from tobacco, jagged or sharp-edged teeth, infected gums, badly fitting plates, or foreign bodies held in the mouth, and by eliminating syphilis.

The best time to cure cancer of the mouth even by irradiation is in its earliest stages. Cancer of the mouth can not be treated by rule. Each is an individual problem, for no two cases are alike. Therefore any statistics of results obtained from any form of treatment, or any special technique, will depend in great part upon the classification of the cases, or the stage of the disease when treatment was begun. In a previous paper,³ Dr. Vastine and I described our technique and our personal results. From these studies, and with our present technique, we believe that about 50 per cent can be gotten well if treated completely and skilfully when they first consult a physician.

The results on patients as they reach the radiologist today are much less satisfactory than the above estimate, and when the five-year cures of all cases coming to a clinic are counted, they are for the tongue, 22 per cent (Quick) to 32 per cent (Berven); for the floor of the mouth, 34 per cent (Berven); for the mandible 18 per cent (Berven); for the cheeks 26 per cent (Berven). Much depends upon the extent of the disease when treatment is begun. In the early cases (without metastases) Berven obtained 59 per cent, and for the late cases 0 per cent in cancer of the tongue.

In carcinoma of the tonsils, with teleradium, Berven obtained 39 per cent of three-year cures.

In cases of carcinoma of the upper jaw with the most modern irradiation associated with minor surgical operations, about 35 per cent can be expected to recover (Crosby-Green, Berven, New).

In general, when treating cancer of the mouth and jaws individualization is absolutely essential, and radium, when used skilfully and in sufficient quantity has been found more efficient than the X-rays.

Cancer of the Uterus, which comprises about 30 per cent of all cancers (Birch-Hirschfeld, Arth. Welch), is in great

³Pfahler & Vastine:—Radiation Therapy in Cancer of the Mouth, *J.A.M.A.* Feb. 23, 1931, Vol. 96, 664.

part a preventable disease if we utilize all of the knowledge now available. It is believed by most investigators that cancer of the cervix—which forms about 90 per cent (Koblank) of the cancers of the uterus (5 out of 6, Bland)—develops upon a preceding cervicitis. The cervicitis is caused by local infections, and especially develops after lacerations incident to childbirth. Farrar found that 96 per cent of his cases of cancer of the cervix had borne children. Bland says, "Injuries of the cervix inflicted during childbirth, followed by eversion, erosion and long-continued irritation and finally culminating in metaplasia of the endocervix form the propitious background for the ultimate development of cervical cancer." Pemberton found only 5 carcinomas in 5,962 patients upon whom trachelorrhaphy, cervical amputation or cauterization had been performed. Smith found only 6 cancers in 3,650 patients who had their cervix repaired, and on the other hand of 498 cervical cancers, 486 had not had any repair of the cervix. Of 1,150 patients who had the cervix cauterized not one developed cancer. Huggins reports 2,985 cases of chronic cervical disease treated by cauterization or excision by the endothermic knife without a single case of cancer developing thereafter. Therefore, by repairing lacerations and following all childbirths until the cervix is healthy, and by treating all cervicitis, most of these cancers of the cervix can be prevented. This requires the education of the laity as to the importance of examining by palpation and inspection any case in which there is any unnatural vaginal discharge, and especially, after the age of 35, to have such examinations twice a year. Recently it has been claimed that when the cervix is painted with a 3 per cent aqueous solution of iodine the part involved by early cancer will not be stained (W. Schiller). I have not been able to confirm this in all cases.

It is now pretty generally recognized that cancer of the cervix is best treated by irradiation in any stage of the disease, when the equipment and the necessary professional and radiological skill are available. When these factors

are missing, and surgical skill is available, then surgery is best. Surgery can only be used in about three-tenths of the cases, as they now come to any large public clinic. Seventenths are inoperable, and their only hope of recovery is from the skilful application of both radium and deep roentgentherapy. It is hoped that as the patients and the physicians become more alert, a greater percentage of early cases will come under skilful radiological treatment.

The surgical technique has been completely developed and has been available for about twenty-five years; while the radiological technique is still undergoing improvement and has been only fairly well developed during about fifteen years. The fact that such able teachers and operating gynecologists as Kelly, Clark, Polak, Norris, Healy, Lynch, Ward, Anspach, Schmidt and others, have abandoned operation in favor of irradiation is in itself significant.

According to the statistics prepared by Seiffert from the Döderlein Clinic in Munich, it was found that of patients with carcinoma of the cervix treated by irradiation in the operable stage, and who followed through the complete treatment, 80 per cent were well at the end of five years. This then is the best chance for the woman who comes early and has a thorough and complete treatment by irradiation. The general results from irradiation, however, in operable cases were only 46 per cent of cures, due to the fact that some patients interrupted the treatment.

In a report from the Ministry of Health in London published in 1927, Dr. Lane-Claypon published the statistics of 6,661 cases of cervical carcinoma operated upon by vaginal or abdominal hysterectomy and found 2,227 were alive at the end of five years, making only 34.1 per cent. On the other hand, she found 1,117 "operable" cases which were treated by irradiation, and 400 were alive at the end of five years, which is 35.8 per cent. Counting all cases that presented themselves to the *surgical clinics*, operable and inoperable, she found that 18.3 per cent were alive at the end of five years, while irradiation in a similar group

gave 22 per cent of five year results. According to these general (London) statistics, therefore, the radiologic treatment showed slightly better results in the same class of cases, even though the radiological treatment was in the developmental stage, and of course operative mortality was avoided.

Ward and Farrar reported 134 cases treated by irradiation from 1919 to 1923, and obtained 53.1 per cent five year cures in the "operable" and "borderline" cases. Heyman reported in 1927 from the Radiumhemmet on 145 "operable" and "borderline" cases in which they obtained 46.2 per cent cures. The percentage of cures counting all cases showed a progressive increase as the technique was improved: 1920=10 per cent; 1921=17 per cent; 1922 and 1923=36 per cent. For stage I=86 per cent; for stage II=42 per cent and for stage III=30 per cent. I am sure that future statistics will show even better results because of improved technique, and a better education of the public. At the Marie Curie Hospital (Editorial, *British J. Rad.* August 1932) in Paris, 587 cases of cancer of the cervix which were treated during the six years previous to 1931 showed 342 or 58 per cent were alive at the end of 1931, or more than one year. Recently before the British Medical Association Centenary Meeting, Voltz of Munich reported on 1,723 cases treated between 1913 and 1926, in which an absolute cure of 18.5 per cent was obtained; Group I—43.2 per cent, Group II—22.5 per cent; Group III—12.1 per cent and IV—2.1 per cent. For the last two years of that period the five year cure rate was 25 per cent. At the same meeting, Lacassagne reported from the Institut du Radium on 678 cases with a five year cure rate on all cases of 26 per cent. Results improved as the technique was improved. Cases treated in 1921 to 1923 inclusive showed 30 per cent five year cures, and 1924 to 1926, the cures counting all cases had risen to 36 per cent. The keynote of success is therefore early diagnosis and thorough, skilful treatment with the most modern technique.

At Erlangen during the years 1921-1926, by the X-rays

alone the absolute cure rate was 20.9 per cent. By the modern technique Voltz reports the cure rate for Group I as 58 per cent, and for Group II 29 per cent. This indicates definite progress from irradiation therapy. For the inoperable cases, there is a 12 per cent cure rate.

In the treatment of cancer of the cervix by irradiation we must not only consider the curative value which is about 25 per cent of all cases, but we must take into account the *palliative value* in advanced cases until we can get all patients to come for treatment while in the earliest stage, when the curability with our best management will run from 50 per cent to 80 per cent. Heyman in reviewing the 1,237 cases treated at the Radiumhemmet, 1914 to 1926, reports 90 per cent were relieved from bleeding for shorter or longer periods; cessation of offensive discharge was obtained in over 50 per cent; while close on 50 per cent were relieved of their pain and about 60 per cent were able to return for a shorter or longer time to their usual occupations.

Cancer of the Body of the Uterus—In most of the statistical reports on cancer of the uterus, cancer of the body makes up about 10 per cent. Of 80 cases treated by irradiation at the Radiumhemmet between 1914 and 1926, Heyman reported 42.5 per cent five year cures. He states however that this material contained an unusually large percentage of inoperable cases. He further states, "The idea that adenocarcinoma should be resistant to radium treatment is in our opinion not tenable. (Healy is of the same opinion). The treatment of carcinoma in the body of the uterus differs but little from the treatment of the same disease in the cervix." Voltz reporting from the Munich Clinic on 107 cases treated by irradiation between 1913 and 1926, shows 45.8 per cent five year cures—66 per cent for the "operable," and 14.3 per cent for the "inoperable," while for the later date, 1921 to 1926, the cure-rate was 62 per cent instead of 45.8 per cent. It would seem therefore that in carcinoma of the cervix *with the most modern technique*, 86 per cent can be cured in Stage I; 42

per cent in Stage II, and 30 per cent in Stage III, and about 62 per cent of all the carcinomas of the body of the uterus can be gotten well with the most modern technique. This of course refers only to the most skillful work.

TREATED BY IRRADIATION—5 YEAR CURES

CANCER OF THE CERVIX

Author	No. Cases	Date	All Cases Absolute Cures	Groups
Voltz	973	1913-26	18.5	I — 43.2%
"	"	"	"	II — 22.5%
"	"	"	"	III — 12.1%
"	"	"	"	IV — 4.9%
"	404	1924-26	25	I — 49.4%
"	"	"	"	II — 23.1%
"	"	"	"	III — 17.9%
"	"	"	"	IV — 4.9%
Lacassagne	678	1919-26	26%	
"	"	1924-26	36%	I — 86%
"	"	"	"	II — 42%
"	"	"	"	III — 30%
Ward	343	1919-27	23.8%	I & II — 53.2%
Hurdon	74	1925-30	26%	
Heyman	1237	1914-26	20%	I — 40.8%
"	"	1914-26	20%	II & III — 15.7%
Healy	1574	1918-30	22.5%	I — 55.0%
"	"	"	"	II — 31.0%
"	"	"	"	III — 15.0%

CARCINOMA OF THE CORPUS UTERI

Voltz	107	1913-26	45.8	— "Operable" 66%
"	39	1921-26	62%	
Heyman	80	1914-26	42.7%	

CANCER OF THE OVARIES

Heyman	134	1914-26		
"	24	"	Inoperable — Irradiation	8.5%
"	36	"	Incomplete op.	" 22.0%
"	28	"	Recurrent	" 25.0%
"	46	"	Prophylactic — Post-op. irradiation	54.0%

Cancer of the Breast—Until recently, cancer of the breast has been looked upon as a surgical condition primarily, and operation has been almost universally recommended if the disease was in an operable stage, and there was present no definite contra-indication to operation. At

present, some rather encouraging results are being obtained by thorough and skilful irradiation by the method of Keynes and applied even in operable cases of cancer of the breast, but the method is still in the developmental and research stage, and there are not available statistics on five year cures.

Most of the irradiation in the past has been given as a post-operative treatment, and for recurrences, and for advanced primary carcinoma. With the object of estimating the value of this irradiation, I reviewed a year ago, 1,022 of my private cases of carcinoma of the breast treated during 26 years, by technique in the process of evolution, and all treated more than four years ago.

Time will not permit a detailed discussion of these cases, but for our purposes tonight, it should be noted that in the "post-operative group," 55 per cent of all these cases were symptom free more than five years, and of the cases that had glandular involvement at the time of operation, there were 46.6 per cent symptom free more than five years, which is more than twice the number that recover from operation alone. We are not yet in a position to draw conclusions regarding the primary irradiation of operable carcinoma of the breast, but surely we can accomplish much in prolonging life and increasing comfort with some cures in the inoperable group. Taking all cases including the advanced primary and the recurrent that received irradiation, there were 36 per cent of five year recoveries. This is a creditable showing but by no means sufficient.

STATISTICAL STUDY OF IRRADIATION IN CARCINOMA
OF THE BREAST (1,022 CASES).
1902 TO JUNE, 1928.

Group		Total	Well over five years.			
a.	Cases receiving both preoperative and postoperative irradiation (92 cases)					
A	I Op. no invol. of gl.....	20	10	of	17	58%
B	II Op. with invol. of gl.....	37	19	of	33	57%
C	IV No gl. at op.—gl. after op.....	19	7	of	17	41%
D	IV Gl. at op. and gl. after op.....	19	3	of	11	27%
Total and Average.....		95	39	of	78	50%

b. Cases receiving postoperative irradiation (263 cases)

E	I	No gl. op.—no gl. when irradiated.....	60	43	of	49	87%
F	II	Gl. op.—no gl. when irradiated.....	100	57	of	98	58%
G	IV	Gl. op.—gl. when irradiated.....	76	24	of	70	34%
H	IV	No gl. op.—gl. when irradiated.....	27	8	of	23	34%
			<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total and Average.....			263	132	of	240	55%

c. Recurrent cases treated by irradiation (433 cases)

I	III	Local recurrence.....	62	29	of	62	46%
J	IV	Rec. gl. ax. and s.cl.....	69	14	of	65	21%
K	IV	Rec. met. med. and lungs.....	31	4	of	30	13%
L	IV	Rec. ax. and s.cl. and med.....	220	29	of	210	13%
M	IV	Loc. les., met. spine and bones.....	19	4	of	14	23%
N	IV	Met. med.—lungs and bones.....	32	1	of	27	3%
			<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total and Average			433	81	of	408	17%

d. Primary inoperable cases treated by irradiation (178 cases)

O	IV	Fix. sk. or gl. and ax. s.cl. and med....	117	27	of	108	23%
P	IV	Fix. sk. or gl. and ax.s.cl. and b. met..	33	7	of	23	30%
Q	IV	Made op. without chest met.....	20	11	of	19	57%
R	IV	Made op. with chest (pall. op).....	5	2	of	5	40%
S	IV	Remov. by electrocoagulation.....	3	1	of	3	33%
			<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total and Average.....			178	48	of	158	30%

e. Primary operable cases treated by irradiation (53 cases)

T	I	Prim. op. unques. malig. (refused or phys. not fit).....	40	30	of	37	81%
V	I	Prim. op. quest. malig. (1% of all cases)	13	10	of	13	76%
			<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total and Average.....			53	41	of	50	82%
			<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Grand Total and Average			1,022	341	of	934	36%

Cancer of the Tonsil, Pharynx, and Larynx.—Epitheliomas of the tonsillar regions as they reach the radiologist usually involve the tonsil and tonsillar pillars, and in about half of the cases extend to the palate and uvula, and frequently, to the tongue and epiglottis. The metastatic nodules usually are found under the angle of the jaw. Of 46 cases treated by irradiation by Coutard, 26 per cent were well two years, and 23 per cent were well after five years.

Epitheliomas of the hypopharynx usually involve the

postero-inferior edge of the tongue and extend to the epiglottis, and to the aryteno-pharyngo and glosso-epiglottic folds. In 89 cases, Coutard obtained 20 per cent of cures for two years, but at the end of five years only 10 per cent remained well. This low percentage of recoveries is probably due to the advanced disease, for it has seemed to me that this group of cases are especially radio-sensitive.

Carcinoma of the larynx is now definitely a radiological problem, and we believe that all extrinsic cases are best treated by irradiation. Coutard has had most experience and treats by means of highly filtered high voltage X-rays. It has seemed to me that better results are obtained by highly filtered gamma rays, and with little or no damage to the normal tissues. He has treated 77 cases with 32 per cent symptom free at the end of two years, and 28 per cent at the end of five years. This is a great gain over our former results, and with further development of technique and the treatment in an earlier stage, better results may be expected.

Cancer of the lungs seems to be on the increase. The roentgenologist is very essential in diagnosing the disease; in determining its extent; and in studying the progress made by any form of treatment. The treatment is entirely by irradiation, and while the difficulties of irradiation are great, some encouraging results have been obtained. Leddy has recently reported upon 42 cases treated by the high voltage roentgen rays, and in 10 cases he obtained at least palliative results lasting from fifteen months to four years.

Malignant disease of the lymphatics in general is radio-sensitive, and our most brilliant local results are obtained in these cases, but the very conditions that make this type of tumor radio-sensitive also make it spread rapidly through the system, and our failure to obtain many permanent cures in these cases is not due to the local disease, but due to the distant metastases which ultimately are apt to get beyond our control. Our hope in this group is in treating very thoroughly while the disease is local and in treating the neighboring areas so as to avoid extensions.

Malignant disease of bone has not been treated extensively enough by irradiation to establish any reliable statistics.

Metastatic carcinoma of bone responds to irradiation sometimes brilliantly, and patients with extensive disease may sometimes be kept in comfort and apparent health for five years, but I know of no permanent cures, and generally, one can only hold the disease for about two years.

In osteogenic sarcoma some encouraging results have been obtained, but it seems that early amputation, or according to my experience, preliminary irradiation and then amputation gives the best results.

In giant cell bone tumors very satisfactory results have been obtained. While it requires from one to five or more years for recalcification, the function of the extremity is retained throughout the treatment, or is soon restored. A spontaneous or traumatic fracture is no contra-indication to the treatment, and we therefore believe irradiation to be the best available treatment.

In the malignancies of the alimentary canal very little has been accomplished by irradiation. A few scattered cases seem to have been cured, but certainly there should be no delay in any operable case.

In brain tumors some excellent results have been obtained in the irradiation of the sellar adenomas, but elsewhere, our results have been mostly palliative.

I have omitted from this brief summary all reference to etiology, diagnosis or technique, all of which are very important. As our equipment and technique improve, and the public have eliminated the fear of operation, and learn the importance of early treatment, our statistical results will surely improve.

MIGRAINE AND ITS TREATMENT

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Migraine, or "sick headache," as it is often called may be defined as a recurrent headache, usually unilateral, often incapacitating in severity, culminating in nausea or vomiting, frequently accompanied by evidences of disturbance in various parts of the brain, occurring against a background of relatively good health and associated with a familial history of headache, convulsions or other paroxysmal disorders. While this definition is quite satisfactory for the great majority of cases, it need not be considered as an absolutely rigid one since many deviations from these criteria may occur. A gradual broadening of the concept of migraine has taken place during the last twenty years introducing a considerable degree of elasticity into the limitations of the disorder. This has resulted in the grouping together of a considerable number of signs and symptoms as a symptom-complex called migraine. No case will present all of the symptoms and signs of this syndrome and one or more of the important cardinal manifestations may fail to appear. On account of the significant grouping of subordinate evidences of disturbance the absence of important symptoms need not invalidate the diagnosis of migraine and even the cardinal symptom, headache, may be insignificant or absent.

The diagnosis of migraine requires a thorough physical examination and in many instances comprehensive study by all the available means of laboratory diagnosis. Such an examination often demonstrates a physical basis for the symptoms and in such instances, the diagnosis of a symptomatic migraine may be made.

This type of the disorder may be found to depend upon uncorrected refractive errors, sinus diseases, severe secon-

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dary anemia, nephritis, serious disease of the gastro-intestinal tract and its appendages, particularly the liver, intoxications—such as lead, gout or other exogenous and endogenous poisons and many miscellaneous conditions. A careful neurological examination may demonstrate the presence of a neoplasm of the brain affecting specialized areas or structures, internal hydrocephalus, tabes, cerebral arteriosclerosis or cerebral edema. If these systemic and organic neurological conditions have been eliminated as productive of the symptom-picture one is then faced with the determination whether or not the headache may be caused by psychogenic factors. This distinction is often difficult and sometimes impossible. The study of psychogenic disorders in the vast majority of instances shows that the patient is achieving or accomplishing something by means of the illness. The asset value of psychogenic disorders must always be borne in mind. The evaluation of the many factors bearing upon this phase of the situation requires a careful and painstaking history, concerning not only the intimate character of the headache and the patient but also the more remote social, economic, familial and other environmental features. It is rare indeed that this type of patient is found to present a monosymptomatic complaint. Many other indications of the underlying conflict which forms the basis for the symptom-picture may be discovered in addition to the presenting symptoms. In general, these evidences of disordered function fall into the category of the hysterical or conversion symptoms by which physical manifestations serve as the external indications of mental conflicts. These disorders may appear as disturbances in any of the general or special sensory or motor spheres. The majority of psychogenic disorders cannot be explained upon the basis of the anatomy and physiology of the nervous system. Conflicting symptoms appear and many important manifestations which should accompany the evidences of real disorders of the nervous system fail to make their appearance. The attitude of the patient, his contact with the physician, his behavior during the examination, and the general impression

gained from an estimate of his story and his presentation of it are often the most important factors leading to a correct clinical evaluation of the situation.

With the elimination of the symptomatic and functional types of migraine one is able to arrange the remaining cases in certain fairly well defined sub-groups. It must be remembered, however, that migraine has as yet no definitely established individuality and that it presents features which ally it with a whole galaxy of clinical disorders including such dissimilar clinical entities as the paroxysmal disorders and familial periodic paralysis. Variations in its manifestations, alternations from one sub-group to another or transitions between one or another of the more closely related disorders are so frequently met with that the majority of investigators consider the symptoms as the expression of an underlying tendency capable of producing a highly diversified syndrome.

With the growing appreciation of the ramifications of the disorder, many investigators influenced by the theory of the reflex causation of the symptoms endeavored to differentiate groups such as ear, eye, gastric and genital types according to the supposed identification of reflexogenous zones operative in the individual case. The possibility for clinical confusion upon such an etiological basis is infinite. The more accurate grouping of cases according to etiological factors will have to await a more intimate knowledge of the disorder.

It is open to considerable doubt whether all of the types now grouped under the caption migraine rightly belong there. It is highly possible that some of the types have been incorrectly included under this heading. The final determination of these facts will have to await a greater knowledge of the mechanism of the disorder.

Due to our ignorance of the fundamental causes and factors which underlie the manifestations of this disorder the differentiation into types must be based upon clinical

criteria and such a division for descriptive reasons serves a definite purpose.

The occurrence of this disorder in many individuals is characterized by a definite and often stereotyped appearance and course. These relatively constant symptomatic manifestations make it possible to determine a certain number of well recognized types.

Simple Migraine or Hemicrania

This is the simplest type and by far the most frequent. It is characterized by a unilateral headache of varying severity which usually is followed by nausea, and in severe cases, by vomiting. It may be associated with certain prodromal symptoms which warn the patient of the impending attack but it usually is not followed by any sequelæ and within a relatively short time after the cessation of the headache the patient returns to a state of normal comfort.

Ophthalmic Migraine

This type of the disorder is characterized by symptoms which affect the visual function. The manifestations of ophthalmic migraine are somewhat more irregular in their course and development than those of simple migraine. There may be only one or two attacks during an entire lifetime or the symptoms may occur every day. The association of ophthalmic migraine with other distinctly paroxysmal or convulsive disorders is perhaps somewhat closer than in simple migraine, occurring in about 7.2 per cent of cases. The paroxysmal manifestations usually consist of pettimal attacks, twilight states or typical convulsive seizures.

The disturbances in vision may vary tremendously in character and in degree. The distribution of the disturbance may be limited, affecting a part of the field of vision of one eye alone, it may be homonymous, or it may result in an obscuration or loss of vision in both eyes. It may consist of little more than a fine cloud or a single colored shimmering effect. In many instances it may appear as a black, dull-colored or shining spot which, either motionless

or moving about, gradually increases in size until it occupies a definite part of or the whole of the visual field. A simple transitory amblyopia may appear, first as a clouding of vision, then a complete amaurosis which finally disappears without any sequelæ. In many instances a shimmering, wave-like or vibrating distortion of the appearance of objects, may take place. The most characteristic manifestation is the scintillating scotoma which usually appears in a circumscribed area of the visual field, often presenting an homonymous distribution. It consists of jagged, straight, zigzag or irregular bands of light, often in movement, less often stationary. It frequently presents itself as the so-called "fortification figures" in which the center of the visual hallucination is a scotoma surrounded by a jagged or vermicular band frequently consisting of several colors. These manifestations, considered to be irritative, are gradually replaced by paralytic phenomena, a scotoma appearing in the field previously affected by the scintillation. This scotoma may be either relative or absolute depending upon the degree of the disturbance. It persists for a variable length of time. The characteristic headache usually appears as the irritative or paralytic manifestations of the disorder fade away and may be mild, severe or incapacitating. It is usually followed by nausea and vomiting. The ophthalmic type is often followed by definite sequelæ usually as a scotoma which may last for a variable length of time. Where the disturbance is extremely severe or frequently repeated, the recurrent scotoma may become fixed with a permanent loss of vision.

Psychic Migraine

This form of the symptom-complex has been described by various investigators and sufficient corroboration of their observations has been recorded to justify the establishment of a definite type of psychic alteration associated with periodic headache. It has, however, been attacked by other investigators and is perhaps not so firmly substantiated as the simple and the ophthalmic types. There are not, however, the definite objections to it which can be raised

in the case of the facioplegic and the ophthalmoplegic types of migraine. The mental disorder seemed so definite and characteristic to one investigator, that he originated and used the term "dysphrenia hemicrania transitoria" to describe the disturbed psychic state. Psychic involvement in the course of migraine usually appears as a twilight state in which the patient is confused, disoriented as to place and time with occasional hallucinations of sight and hearing. These hallucinations may attain a marked degree of clarity. Acts of violence, including suicide and murder, have been perpetrated in the migrainous psychotic state. This aspect of the disorder has been considered of such importance that it has been stated that in any crime characterized by instantaneousness, fierceness and brutality, careful search must be made in the personal and family history of the patient for paroxysmal headaches or convulsions, the supposition being that the acts of violence may represent crimes committed by an individual not in the proper control of his psychic activities.

Emotional disturbances with changes in mood, and a feeling of depression quite commonly accompany or follow the headache. These may go on to a misanthropic, asocial, introspective type of reaction. There is frequently a weakness in the mental processes with distractibility and some incoherence. Certain other patients present disturbances of the manic-depressive type in which there may be restlessness, irritability, change of personality, alternating with depression and retardation of psychomotor activity.

Psychic equivalents have been described by numerous writers in which temporary disturbances of the psychic sphere may alternate with definite attacks of migraine. These episodes are characterized principally by depression, a feeling of strangeness, confusion, absent-mindedness and a sense of unreality. Whether these and other similar manifestations can be attributed to the same type of disturbance which underlies the other features of migraine may, perhaps, be open to some doubt. It would seem justifiable tentatively to include the psychic form of migraine and

the psychic equivalents as integral constituents of the migraine syndrome and await further investigation for absolute justification as to their existence and inclusion in the symptom-picture.

Abdominal Migraine

For many years, attacks of recurrent pain apparently without cause and unassociated with any demonstrable disease of the intra-abdominal organs has been a matter of considerable interest and perplexity to physicians. The clue to the essential character of some of these attacks of abdominal pain was furnished by the observation that they were associated with or followed by typical migrainous headaches. Due to the discovery of this association a type of migraine has been described as "abdominal migraine." The attack is characterized by pain which is variously complained of as cutting, boring or grinding and situated anywhere within the abdomen but usually in the epigastrium. In a certain number of instances these crises of abdominal pain may take place without the headache. The abdominal pain is usually associated with nausea, vomiting and diarrhoea. No further evidence of disturbed function of the abdominal organs can be elicited by physical examination. In certain instances abdominal migraine may alternate with typical attacks of migraine or a simple migraine may gradually be transformed into the abdominal type of the disorder. In many instances the family history is of considerable value in establishing the diagnosis. Either migraine itself, various manifestations of the convulsive state, certain exudative disturbances of the skin or asthma may be discovered in members of the same generation or in the familial history of the patient. A sufficient number of carefully observed cases has already been reported to supply a firm basis for the recognition of the abdominal type of the disorder.

In line with the identification of the abdominal type of migraine certain authors have described a thoracic type which is characterized by disorders of the heart and lungs.

Recorded instances of this type have been relatively few in number. Cases of paroxysmal tachycardia have been reported with associated severe headache of a migrainous character. Certain disorders of the pelvic organs characterized by sudden forced evacuation of the bowels or bladder, disturbances of the genital organs; associated with severe headache, nausea and profuse perspiration have been described as a pelvic type of migraine. At the present time it is perhaps inadvisable to establish a thoracic or pelvic type of migraine since the number of reported cases is relatively insignificant but the possibility of this sort of a disturbance should always be borne in mind in connection with vague obscure thoracic or pelvic symptoms associated with a migrainous headache.

An abortive type of migraine has also been described in which various prodromal symptoms appear, continue for a variable length of time and then disappear without the development of a severe headache or other manifestations of the disorder.

There are two varieties accepted in the past under the heading of migraine which may be seriously questioned, the ophthalmoplegic and the facioplegic types. The ophthalmoplegic type of migraine is characterized by weakness, usually transient, of one or more of the oculomotor nerves. The third cerebral nerve is the one usually affected. The disturbance may be total or the involvement of the nerve may be a differential one, affecting only certain parts of the nerve. In rarer instances the trochlear or abducens nerve may be affected by the disturbance in function.

A number of features of the ophthalmoplegic type of migraine may be cited to demonstrate that this form of the disorder is somewhat different from the other types. The age range is greater, individuals as young as two years of age and as old as fifty having been afflicted with disturbances of the oculomotor nerves. There is a well defined type of recurrent oculomotor paralysis which is not associated with headache. The headache shows a definite ten-

dency to be localized and develops usually above, behind or in the affected eye. The recurrence of the disorder is much more variable than in the other types of migraine. It is much more apt to be followed by permanent sequelæ. All of the cases which have been investigated at autopsy have shown localized lesions in or near the affected nerve and this constant finding of organic pathological change in ophthalmoplegic migraine would definitely suggest that it is not similar to simple migraine which so far as is known is a patho-physiological disorder. These facts would tend to throw some doubt upon the wisdom of including the ophthalmoplegic type of the disorder in the general group of migraine. Evidently a similar mechanism must be operative in the production of many of the symptoms but this does not mean that the underlying basis is the same in the two instances.

The other type of migraine which was unreservedly accepted by the older writers but which has been challenged by later and perhaps more critical consideration is facioplegic migraine. This form of the disorder is characterized by a recurrent paralysis of the seventh nerve of one side or the other, associated with discomfort within the head. In the majority of the reported instances the establishment of an independent type to accommodate such cases cannot be justified and apparently they represent only isolated or recurrent attacks of facial paralysis associated with more than the usual amount of head-pain. While it may be impossible at this time to state definitely that there is no type of migraine in which the innervation of the face is involved and that there is no such clinical entity as the facioplegic type of migraine it is perhaps wise to withhold any definite decision and await further and more definite reports of disorders of this kind.

The mass of evidence is so overwhelming concerning the appearance of migraine in families and in parents and descendants that it may be accepted as proven. Many investigators believe that in any family where migraine has developed 90—100 per cent of all the descendants will show some sort

of inherited tendency to migraine or one of the many disorders associated with migraine.

The inheritance factor in migraine is closely linked with the tendency to the development of other paroxysmal manifestations. Investigations have shown that migraine in the antecedents is more apt to produce convulsions in the descendants than the actual occurrence of convulsions in the parents. The inheritance factors have not as yet been definitely established and it is not clear whether there is a direct sex-linkage in the inheritance. The Mendelian character of the inherited tendency, whether dominant or recessive is also equally uncertain. The inheritance of migraine seems to be linked in some definite although intangible manner with the transmission of asthma, hay fever, urticaria and eczema.

Except in instances where migraine is closely associated with the menstrual function the recurrence of the attacks tends to be rather irregular. The attacks may occur as frequently as once or twice a day or they may only appear two or three times during the life of the individual. It has been estimated that in 82 per cent of the cases the attacks occur about once a month and in 52 per cent every two weeks or more frequently. In many instances there seems to be a definitely immune period following the attack during which time the disorder does not recur, but on the other hand the attacks may become so frequent that a *status hemi-cranicus* may be established. The occurrence of the disorder is most frequent between 18 and 35 years of age. It may appear, however, at any age epoch.

Until recently the disorder was considered to be much more frequent in women than in men. Investigators have stated that it occurs four times as frequently in women as it does in men. This preponderance in the female has, however, been questioned of late and figures have been presented which show the actual incidence of the disorder is about equal in the two sexes. The disparity noted in other investigations has been attributed to the fact that migraine is

apt to be more severe in women than in men and that women are more prone to seek relief than are the male members of the family. No especial influence seems to be exercised by occupation or other general factors. It may be stated that it is more apt to occur in those who live a confined life and in individuals whose activity is chiefly mental. The conditions described as predisposing or activating the attacks are so general in character that no importance can be ascribed to any of them.

The attacks of headache may develop with practically no warning or there may be a period of varying duration in which there are vague prodromata. Chief among these are a feeling of depression, lack of well being, and diminished energy. There is usually some reduced capacity for work or the patient may be irritable or restless. Certain authors have stated that the attack is preceded by a period of time in which the patient feels particularly well.

The headache may be generalized or may develop in one part of the head and radiate to other regions of the head, face, neck, shoulders or even to the upper extremities. It usually becomes more and more intense until the patient is incapacitated. It has been described as the pressure of a boring instrument or a feeling of distension within the skull as if the bones of the head would spring apart. Almost invariably the headache is associated at some time during its course, usually toward its termination, with nausea and vomiting. There are frequently other evidences of disturbance in the vegetative nervous sphere characterized by vasomotor alterations in the face and head or by actual hemorrhage from the retina, the mucous membrane or parts of the skin. There may be other local sympathetic disturbances leading to a feeling of coldness in the extremities, the appearance of goose flesh and other pilomotor phenomena together with excessive perspiration. The vegetative nervous system control of the organs of the chest and abdomen may become disturbed with the development of definite symptoms attributed to the heart, lungs, gastrointestinal tract, liver and other abdominal viscera. This

type of disturbance may even extend to the organs of the pelvis.

In the course of the attack, motor symptoms either of an irritative or paralytic character may present themselves. These evidences of abnormal nervous discharges may be localized or may be widespread. The usual disturbance is a paresis or actual paralysis of one or more of the limbs. This disturbance may change from one side to the other or may extend from an upper to a lower extremity or vice versa. Evidences of disturbance in some of the localized cortical motor activities may manifest themselves as an aphasia or an agraphia. A specialized type of motor disturbance may appear characterized by strictly cerebellar symptoms in which there is difficulty in equilibration and a definite disturbance in the synergic activity of the cerebellum. This type has been called *hemicrania cerebellaris*.

Disorders of sensation have also been described. The most constant of these is a feeling of tingling or numbness in one or another of the extremities or parts of the face, lips, tongue or mouth.

Disturbances of the special senses, exclusive of the visual function, are much less likely to make their appearance. Vertigo, tinnitus or diminution of hearing may appear. Hallucinatory disturbances of sight or hearing may take place while alterations in smell have occasionally been described.

In many instances a definite relation between the side of the headache and the presumed site of the development of symptoms has been noticed, the headache occurring on the side of the brain which is involved and therefore being opposite to the side in which the motor or sensory symptoms are manifested.

While the termination of the attack may be sudden, in the great majority of instances it is gradual and prolonged over a considerable length of time, the discomfort gradually diminishing, the symptoms declining in their severity and the patient slowly returning to normal.

The attacks may be followed by a more or less prolonged disturbance of function. In instances where the attacks are severe or rapidly repeated the residual phenomena show a greater tendency to become permanent. These sequelæ almost uniformly affect the structures whose functions are primarily attacked during the migrainous seizure. The occurrence of permanent sequelæ is usually attributed to the development of vascular lesions of one kind or another. In many instances a progressive arteriosclerosis with a gradual obliteration of the lumen of the vessel seems to explain the permanent loss of function. In other instances frequently repeated vaso-spasm seems to gradually reduce the viability of the cells which the vessel should nourish, with a gradual extinction of their function.

A considerable number of theories have been elaborated to account for the causation and to explain the varied manifestations of the disorder.

The Reflex Theory

The reflex theory is based upon the assumption that the migrainous attack results from the presence of a source of irritation somewhere within the body. The only one of these sources of irritation which has attained any degree of acceptance is prolonged eye-strain. With uncorrected refractive errors or conditions of improper illumination it seems definitely determined that such abuse of the eyes may result in attacks of migraine. It is self-evident that this cannot be the only cause for the attacks and that some tendency inherent within the disorder must be present to enable the eye-strain to produce its results. Too many individuals suffer from uncorrected refractive errors, and too many individuals with perfectly normal eyes have migraine to make it possible to explain all cases of migraine upon this basis.

The Central Theory

The central theory of migraine would explain the attacks upon direct, general or local changes in pressure or abnormal conditions of pressure within the cranial cavity. The

cavities of the brain, the brain substance itself and the coverings of the brain, including the skull, have all been blamed for the development of the attacks on the basis of some central change in pressure or other irritation. A critical examination of the foundation for this theory does not satisfactorily explain the recurrent and often periodic character of the disorder, neither does it make clear any mechanism which could bring about the changing manifestations of the attack. None of the symptoms, not even the headache, can be explained on the basis of this theory. The objections which can be raised to this theory are insurmountable and it is apparently impossible to explain the various manifestations of the disorder upon such a purely mechanistic conception as this central theory.

The Allergic Theory

A connection of some kind between attacks of migraine and allergic processes has been postulated by many investigators. The association of migraine with disorders of a demonstrated allergic character, such as hay fever, eczema, urticaria and asthma, the production of skin reactions by the action of known allergens and the elimination of attacks by careful attention to diet and desensitization, provide a firm basis for the assertion that some instances of migraine are due to allergic processes. The appearance of an eosinophilia which has been reported by numerous investigators would also substantiate this view. While the allergic theory offers hopeful and suggestive possibilities there must remain a definite reserve against the attempt by some investigators to explain all cases of migraine upon this basis.

Only a certain number of patients present a definite skin sensitivity, only a very few react specifically to food allergens, in many the diet may be reduced to not much more than one constituent without influencing the attacks, so that at present it is not justifiable to claim that more than a certain number of cases may be demonstrated to be allergic in character.

The Duodenal Stasis Theory

The role of the gastro-intestinal tract in the causation of migraine, has been emphasized by many investigators. A considerable amount of collateral evidence has been adduced to show that there is some demonstrable change in the gastro-intestinal tract or the biliary apparatus in certain cases. Reports, however, of an entirely negative character have also been placed on record and it must therefore be concluded that marked disturbances in the activity of the gastro-intestinal tract and its related organs may only be coincidental with the migraine. Very little direct evidence of disturbed gastro-intestinal function, demonstrated by means of fluoroscopic or x-ray examination has been brought forward. Perhaps the most that can be said at the present time is that a disordered activity of the gastro-intestinal tract, the liver particularly, may give rise to toxic products which may act in some not as yet understood manner as the detonator capable of producing attacks in a susceptible individual. An appreciation of the fact that toxic processes are called upon to explain every abnormal activity for which there is no demonstrable basis does not increase the confidence to be placed in this theory. The universality and ubiquity of toxic processes and materials makes it difficult to understand why everyone does not suffer from migraine and from every other sort of disorder. Even a very tentative acceptance of such a theory at once throws into relief the other essential factor, that is, the inherent, probably hereditary tendency which must be present in order that the toxic substance working in its presence shall be able to eventuate in the characteristic attack.

The Endocrine Theory

The two glands of internal secretion which have been considered most seriously as closely related to the production of migraine are the hypophysis and the gonad.

Many clinical considerations have suggested the connection between the crisis and these two incretory glands. The

remarkable temporal coincidence between migrainous headaches, menstruation and the cessation of the headaches during pregnancy, lactation and after the menopause has been recognized for centuries. The relation between gonadal activity and migraine is much more dramatic in women than in men, but its cessation after radiation of the testicles in certain instances may indicate that a similar relation is present in men also.

The other gland of internal secretion which has been implicated in the production of migraine is the hypophysis. The role of the gland in the migraine mechanism may be played through pressure of the enlarged gland upon the surrounding structures or through disturbed hormonal relations or both. The anatomical location of the hypophysis supplies a most attractive basis for the supposition that an increase in the size of the gland can directly affect structures which could produce practically all of the symptoms of migraine. The restriction of the gland within the walls of the osseo-membranous space, the pituitary fossa, could explain the headache and the nausea and vomiting, the optic chiasm and tracts lie immediately above rostrally and laterally, and pressure upon them could be responsible for the visual symptoms, the carotid artery and its branches, the anterior and middle cerebral arteries are directly lateral and somewhat ventral and a circulatory interference in them could explain many of the symptoms coming from the cortical areas, while pressure upon the floor of the third ventricle or a disturbance in its neural connections could explain all of the vegetative nervous symptoms. A number of general considerations such as craving for sweets, a low blood sugar, polyuria, the occasional appearance of acromegaly and the observation that activities which call forth an unusual hypophyseal activity are identical with those which may precipitate an attack, such as over-exertion, hunger, fatigue, etc. seem to link the hypophysis with migraine. Certain investigators have demonstrated, post-mortem, an asymmetrical position and a tendency on the part of the hypophysis to encroach upon the

carotid artery and the cavernous sinus in patients who had suffered from migraine. Unfortunately for their theory, these conditions were not limited to migraine. Other investigators have demonstrated unusual and abnormal calcification in the region of the pituitary fossa.

In an investigation of the hormones of the hypophysis and the ovaries now being carried on at the Neurological Institute and the College of Physicians and Surgeons, it has been found that theelin, the ovarian follicular hormone is either markedly reduced or absent whereas prolactin the hypophyseal hormone is almost regularly present in the urine of patients suffering from migraine. This is a condition found heretofore only in pregnancy, after the menopause and with certain neoplasms of the genital tract. In following the excretion of these hormones, it was found that the amount of prolactin was regularly increased a day or so before the onset of the migrainous attack. These observations are apparently the first factual evidence connecting the hypophysis, the ovary and the migrainous attack. Further investigation will be necessary to discover the many other links in the chain, but these facts would seem to substantiate fully the assumption that some part of the mechanism of migraine is dependent upon the interaction of the hypophysis and the ovary.

The Vasomotor Theory

The theory which will most satisfactorily explain directly many of the features of the migrainous seizure is the one which is based upon the activity of the vegetative nervous system in the production of local constriction of the blood vessels. The character and the appearance of the symptoms, the very evident disturbances of circulation in the head and other parts of the body, the demonstration of a disturbed circulatory reaction to scratching the skin, the transient character of the attack and the development of sequelæ can all provide evidence which closely associates the disorder with a disturbed vasomotor control. The participation of the vegetative nervous system and its vaso-

motor control while not in itself sufficient to explain the entire picture is probably one of the links in the pathophysiological process which results in migraine.

Perhaps a combination of the endocrine and the vasomotor theories presents the best basis available to account for this kaleidoscopic symptom-picture. This hypothesis would presuppose an irritability of the vasomotor system which is at time aroused into abnormal activity by a change in the relation between the circulating hormones. The facts presented showing that there is a distinct imbalance or a disordered relation between the products of the internal glands is a very suggestive bit of evidence substantiating this hypothesis. The remaining links in the chain are as yet undetermined. This field is a very profitable one for further investigation.

The present status of the metabolic and biochemical investigation of patients suffering from migraine is unsatisfactory. No group of patients of sufficient size has been investigated with enough thoroughness to establish any absolute conclusions as to the condition of the body fluids. The great majority of investigations have been confined to special fields and the groups examined have been uniformly small.

The repeated investigations of the urine have been barren of any satisfactory or significant results. The only real deviation which has been recorded is a diminution in chloride excretion during the premigrainous period. It has been claimed that a pentosuria frequently accompanies the attack.

No definite changes in the blood have been recorded except the appearance of an eosinophilia as high as 15-16 per cent and also the appearance of an increased amount of cholesterolin. This eosinophilia was reported in a group of patients presenting marked sensitization and is not corroborated by other observers. The cholesterolinemia has been demonstrated to reach 300 mgm. per 100 c.c. of blood, the normal value being about 210 mgm. Except for these varia-

tions no definite alteration in the morphology or chemical constitution of the blood has been established by any investigator.

The examination of the spinal fluid both during the interval and during the migrainous attack, the investigation of the basal metabolic rate and the estimation of the blood pressure have been equally unproductive of significant values.

X-ray examination of the skull by certain investigators has demonstrated definite changes, particularly in the development of abnormal ossification or calcification in the interclinoid ligaments and also other evidences of abnormal bone formation in the region of the sella turcica. These changes have also been found in patients not suffering from any known disturbance of the central nervous system. Their exact relationship, therefore, to migraine does not yet stand as proved.

In regard to the morphological constitution of patients suffering from migraine no significant conclusions have been reached. No group of cases sufficiently large to warrant an authoritative pronouncement has been studied. Any relation between the morphologic constitution and this disorder has not been demonstrated. Investigations have shown the co-existence of numerous abnormalities in morphological development not only in the bones but also in the soft tissues. However, these anomalies are those which might well be found in any large group of individuals suffering from any disorder.

The contributions of general pathology to the understanding of migraine, exclusive of the ophthalmoplegic type, are negligible. As has already been mentioned, autopsies have been performed on a considerable number of patients who had suffered from ophthalmoplegic migraine and in these instances definite pathological alterations have been found in the vicinity of the oculomotor nerves or involving the nerves themselves. These have principally been neoplastic formations on or about the nerves. Asser-

tions have been made that in migraine there exists an abnormal relation between the hypophysis and the surrounding structures. The applicability of this assertion to migraine is, however, greatly weakened by the further statement by the investigator that this same situation was found to exist in a miscellaneous group of conditions such as hysteria, convulsive disorders, general paralysis and melancholia. Only one or two reports of autopsies performed on patients who had suffered from migraine have appeared in the literature. These reports are entirely devoid of significant conclusions which could be connected with the disorder. The careful pathological investigation of patients who had suffered from migraine is of essential importance. In any such investigation the exact relationship of the hypophysis to the surrounding structures, the minute condition of the vascular tree and especially the condition of the vessels supplying areas which have shown definite focal symptoms and the histological appearance of the cells in these areas must be exhaustively studied before any conclusions may be reached as to the pathology of the disorder.

Treatment

Practically every known form of therapy has been tried by clinicians in the attempt to remove the causative factors of migraine or to alleviate the symptoms. The number and diversity of the therapeutic agents which have been used in the handling of these patients would indicate the non-specific condition of therapy in the disorder. Almost every report containing the results of treatment hails the brilliant results obtained by some favorite therapeutic agent; each separate form of treatment is successful in the hands of the individual therapist and no one has yet reported any consistent group of failures. The majority of the reports are based upon relatively small groups of patients.

There are a number of general principles to be considered and applied in the management of migraine. The essential basis for treatment is the differential diagnosis. Every patient suffering from migrainous attacks should be

thoroughly examined systemically and neurologically. The eyes and spaces associated with the nasal cavities should receive adequate investigation. Eye-strain or other ocular disturbance and unsuspected disease of the accessory spaces of the nose are often the cause of symptomatic migraine; they must be eliminated before the condition can be considered as a true migraine. The patient should then receive a thorough investigation by means of a laboratory study if possible.

The warning of Tzanck that one must be cautious in estimating the results of any definite kind of therapy, since any material change in almost any direction in the patient's regime is apt to be followed by at least temporary improvement can be appropriated as a therapeutic principle. Some definite change should be made in the life habits of the patient suffering from migraine if it is in any way possible. This should apply to his work, his play, his food, his mental attitude and his philosophy of life. Glaring inequalities of emphasis in the patient's interests and activities should be corrected and his manner of life made as rational as possible. Excesses in all directions should be curbed. The salutary effect of exercise especially for the sedentary patient cannot be over-emphasized and any outline of treatment must always take full cognizance of this feature. Rest and change must also be enforced for those under material physical, mental or emotional pressure. The importance of regular holidays, vacations and time off during the day or the week should be stressed.

The management of the acute attack does not present much opportunity for therapeutic effort except along the lines of medicinal therapy. The patient is so intensely uncomfortable that usually he will not tolerate any mechanical procedures and often will not even allow himself to be approached by nurse or doctor. The room should be darkened and the entrance of stimuli of any kind whatsoever reduced to a minimum. An ice-cap to the head and hot-water bottles to the feet or hot mustard foot baths sometimes seem to relieve the intensity of the attack.

The nausea, vomiting and retching can frequently be controlled or at least reduced by glucose enemata. A warmed 10 per cent solution of glucose, in quantity from 5 to 10 ounces, can be introduced into the rectum every two hours or so. To the enema may be added 20 to 40 grains of bromide and 10 to 20 grains of chloral hydrate. If the larger quantities of the drugs are used, the enemata should not be repeated more frequently than every three hours. Sodium luminal by hypodermic, in one or two grain doses frequently diminishes the tendency to nausea and vomiting. No foods or liquids should be given during the period of acute emesis. Cracked ice may be allowed to melt in the patient's mouth.

The special therapeutic procedures are principally used in the interval treatment and may be separated into a number of groups.

In view of reported gastro-intestinal and biliary disorders it is wise in all cases which show any functional disturbance of these organs to direct the treatment toward them. The principle measure to be adopted is, of course, dietetic. Aside from dietary regulation the chief procedure which has been suggested is intraduodenal lavage with infusions of 33 1/3 per cent magnesium sulphate. From two to four ounces may be introduced through a duodenal tube. The result is to produce an active flushing of the duodenum and of the biliary passages by means of the fluid drawn from the circulation by the presence of the magnesium sulphate in the duodenum. This method of treatment has met with great success in the hands of those who have used it. Other investigators have advocated an even more vigorous attack upon the intestinal tract including duodenojejunostomy and other operative procedures; but these more radical methods of treatment are not to be advised unless the condition of the gastro-intestinal tract itself makes operative interference necessary. The presence of the migraine alone is not sufficient justification for such extensive surgical procedures.

Non-specific protein therapy is advocated by a considerable number of investigators. The purpose of this treat-

ment is to produce a hyperthermia which has been said by some mysterious alterative effect to influence the underlying basis for migraine. A number of materials have been suggested for this form of therapy. The injection of autogenous whole blood or serum has been advocated. The technic includes the withdrawal of 20 c.c. of blood and its immediate reinjection either subcutaneously or intramuscularly or the serum may be injected after coagulation. The use of old tuberculin in doses varying from 1/10, 000, 000 to 1/1,000,000 at first twice a week and later once a week has been advocated by a number of clinicians. Those who have used this method of treatment report that its use has resulted in material improvement in many instances and cure in a number of cases. Peptone has also been used either by mouth or by intravenous injection. Armour's peptone, 0.25 c.c. of a 5 per cent solution increasing by 0.25 c.c. until a maximum of 1.25 c.c. is reached, has been used with quite satisfactory results.

Other authors have injected typhoid vaccine intravenously beginning with $2\frac{1}{2}$ million bacteria and increasing the dose according to the results obtained. Other similar therapeutic agents such as aolan, hyperthermin, vaccinurin and "cewega," a crystalline plant protein, have been used successfully in the production of transient fever. The use of cholin, an oxidation product of cholic acid has also been tried in doses of 0.25 gram twice a day, the dosage being reduced after the second and third week and then continued for an indefinite period. None of these methods, however, apparently results in any permanent cure of the migrainous state and the notation constantly recurs that after the treatment has been interrupted it is necessary to repeat the series of injections.

The dietetic treatment of migraine follows three general principles:

1. Non-specific diets; 2. Non-allergic elimination diets;
3. Ketogenic diets.

According to the special predilection of the particular in-

investigator any of the constituents of the diet, protein, carbohydrate, fat, water, mineral salts, may be modified in the attempt to prevent the recurrence of the migrainous attack. It is, of course, self-evident that in patients who present an unhealthy condition of the intestinal tract definite steps should be taken toward the improvement of this phase of the situation. The advocates of the restriction of this or that constituent of the diet have almost universally reported good results. Where there is a tendency toward the development of putrefactive processes those articles which increase this condition should be eliminated and the production of gas reduced to a minimum by the restriction of fats and carbohydrates.

Dietary restriction in the treatment of migraine may be strikingly successful. The decision as to the actual type of dietary control to be exercised will depend to a considerable extent upon the condition of the patient and his general make-up. It is along the lines of dietary control that a definite change can be made in the patient's general metabolism and thus produce the critical alteration which may diminish or prevent the attacks. The obese sedentary individual should be placed upon a reducing diet and regime and no effort spared until a steady, reasonable reduction in weight results. The spare thin overactive individual should be placed upon a high caloric diet with a regime containing enough rest to allow the deposition of a reasonable amount of reserve flesh and adipose tissue. For the patient who eats nothing but fats or carbohydrates should be prescribed a balanced diet containing proper quantities of these constituents.

The results obtained by the identification and elimination of specific allergens is often most dramatic and most satisfactory to the patient. If there is any suspicion of a sensitization in the patient a careful and systematic search should be made by those competent to handle this sort of an investigation. Not only the routine skin tests but also where indicated the elimination diets should be used. Many observers believe that from 30-50 per cent of patients suffer-

ing from migraine can be relieved by the elimination of these allergens. Few individuals suffering from migraine can eat meat, fish, eggs, and other animal proteins in any quantities. The various allergens which have been found to be definitely prone to produce the attack of headache are those contained in sweetbreads, eggs, milk, mushrooms, tomatoes, oranges, shell-fish and chocolate. Few therapeutic results can be more pleasing than the elimination of the migrainous attack through the removal of the guilty article from the diet.

Brilliant results have been reported by many investigators who have attempted to control the disorder by the ketogenic diet. Certain other investigators who have conscientiously tried this treatment report that they could not convince themselves that any favorable results followed its use. The good results obtained by some authors were attributed by others to the effect of the excessive fat favoring the emptying of the gall bladder, biliary passages and the peristaltic action of the duodenum also was supposed to be improved. The beneficial effect upon the migraine was attributed more to the improvement in the general intestinal hygiene than to the specific action of the diet. Certain investigators who have followed the degree of ketosis and the clinical state of patients report that there is no relationship between the ketosis, the amount of improvement in the patient or the actual recurrence of the migrainous seizure. Whatever the actual cause the ketogenic diet does seem to be of value in certain cases of migraine.

The alleviation and cure of the attacks of migraine has also been attempted by means of surgical therapy. Three modes of surgical treatment have been advocated:

1. The removal of certain sympathetic ganglia,
2. The ablation of some of the vascular plexuses of the sympathetic,
3. The occlusion of the middle meningeal artery.

In several instances where occlusion of the middle meningeal artery has been produced surgically prompt relief

from the migrainous seizures has been obtained. This form of therapy has, however, been introduced only recently and a sufficient length of time has not elapsed for the establishment of definite conclusions. The other procedures advocated are certainly serious and in certain instances extremely radical. Some of the reported cases indicate the apparent removal of the entire cervical sympathetic chain and as much of the thoracic chain as lies within reach of the surgeon. The reports of the results are too few and many of the reports too recent to allow for the test of time. Every other method of treatment should be exhausted before recourse to surgery is attempted.

Glandular therapy has always been most popular in the treatment of migraine. The evident relation between migraine and the ovaries and hypophysis as outlined under the endocrine theory of the causation of migraine has supplied ample basis for endocrine treatment. Many clinicians have advocated the treatment of migraine by means of pituitary extract. Many preparations are recommended and administration has been by mouth and by hypodermic injection. Extracts of the anterior lobe are principally used but many authors prefer to use the whole gland. Numerous clinicians have reported the elimination of the attacks by the use of pituitary extracts, particularly when the headaches were strictly menstrual in occurrence.

Similar good results have been recorded by an equally large number of observers who have treated this disorder with ovarian extracts. Quite satisfactory results seem to follow the use of ovarian, follicular or corpus luteum extracts. Striking results have followed the use of progynon, a female sex hormone obtained by extraction from the placenta. This is preferably given by hypodermic injections at first, the tablets being substituted after ten or twenty injections. The tablets are given by mouth three times a day, the hypodermic injection three or more times a week. Very satisfactory results have been obtained by the use of theelin, the follicular sex hormone which can be given by vaginal suppository, by injection or by mouth as theelol.

An extensive series of treatments with theelin is now being carried on at the Neurological Institute, but no report is ready as yet.

Many investigators have recommended the destructive radiation of the gonads by x-ray or radium and many cures of the disorder by the production of an artificial menopause have been reported. Other authors have advised the surgical removal of the testicles or ovaries.

The treatment of migraine by means of drugs may be divided into two phases:

1. Treatment during the interval.
2. Treatment of the acute attack.

Only a few drugs have been proposed for continuous use over any considerable length of time. On account of the evident relation of migraine to the convulsive state many authors have advocated the protracted use of luminal. The general impression is that luminal, of inestimable value in the treatment of convulsive disorders, is not so specific in migraine. Luminal should be given in maximum doses of $\frac{1}{2}$ to $\frac{3}{4}$ s of a grain three times a day. In this dosage, luminal was used in thirteen cases of migraine at the Migraine Clinic in the Vanderbilt Clinic; seven cases were markedly improved, one improved and five cases remained uninfluenced by the drug. Its use may be continued over considerable lengths of time without any appreciable loss of efficacy.

Ephetonin, a synthetic racemic substitute for ephedrin and ephedrin itself have been used successfully by a number of investigators. If ephedrin is used, it should be prescribed as one to two teaspoonsful of the Elixir of Ephedrin Hydrochloride two to three times a day.

On the basis that the disorder is due to a calcium deficiency, a number of investigators have attempted to control it by means of the daily intravenous injection of 10 per cent solution of calcium chloride. Other intravenous preparations of calcium were also used. As is the case with almost

everything suggested or advised in the treatment of migraine, the use of calcium has met with quite satisfactory results. While in certain instances it must be continued indefinitely, in a certain number of cases the tendency to a recurrence of the disorder has been apparently interrupted.

In the treatment of the acute attack a considerable number of drugs have been recommended. The caffein group has been used extensively and black coffee is one of the most popular agents for the prevention and cure of an attack. A number of proprietary drugs with one or another of the caffein group as the principal ingredient have been placed upon the market, each one meeting with a modicum of success. In almost all instances caffein is combined with one or another of the coal-tar products. Caffein in doses of one quarter to two grains, acetanilid, 2 to 3 grains, phenacetin, 3 to 5 grains, sodium salicylate, 1 to 5 grains, monobromated camphor, $\frac{1}{2}$ to 2 grains, the extract of hyoscyamus, $\frac{1}{8}$ grain, tincture of gelsemium, 4 minim., have all been used in varying combinations. Probably one of the most successful combinations not only for the control of the migrainous headache but also in other varieties of discomfort in the head is the so-called Faivre's cachet of oxyquinoline. This is a trade name and the actual combination consists of phenacetin, acetanilid and caffein in the usual doses. Satisfactory results follow the use of one capsule every half hour for three doses and after that one every two hours if necessary. The administration of ergotamin tartrate, also called gynergen, has been suggested by a large number of authors in the treatment of the acute attack and also as an interval treatment. Ergotamin tartrate may be prescribed as 1 to 3 mgm. twice a day if used as an interval form of therapy. As the expected time for the migrainous attack approaches the dosage may be raised to six times a day or it may be administered by subcutaneous injection, 0.5 mgm., twice a day. For the control of the acute attack 2 mgm. by mouth or 0.5 mgm. may be given by intravenous injection and repeated in half an hour. The symptoms of intoler-

ance to the drug are palpitation, nausea and vomiting. If the subcutaneous route is used, the patient should be tested for an idiosyncrasy to the drug by giving a quarter or even an eighth of a mgm. Gynergen, 0.5 mgm., may also be combined with bellafoline in doses of 1 to 4 tablets daily or 0.5 c.c. hypodermically.

Blood pressure reducing principles such as nitroglycerin and nitromanite have been used. Nitroglycerin should be prescribed in doses of $1/50$ of a grain by mouth or $1/100$ of a grain by hypodermic and repeated every half hour. Erythrol tetranitrate in one grain doses may be efficacious.

The two drugs most widely used for the control of the more intense form of the headache are, of course, codeine and morphine. In many instances codeine by mouth or by hypodermic injection is sufficient to abort or terminate an attack. When efficacious by mouth it should be given by this route. If codeine is not sufficiently strong to control the attack, recourse must be had to morphine. In sufficient doses it will alleviate the agony of the most severe migrainous headache and it should be used in adequately large doses and frequently enough to accomplish results. It must never be overlooked, however, that until the cause for migraine is found and controlled one is dealing with a recurrent disorder and therefore the danger of drug addiction must be avoided at all costs. Morphine should not be used until it becomes evident that the headache is to be definitely severe and it should not be used more frequently than is essential. There is no object to be gained, however, by giving inadequate doses.

The treatment of migraine presents an extreme diversification of therapeutic measures. In view of the satisfactory results obtained by many divergent methods it is apparent that the mechanism of migraine may be influenced from many sides. The wide range of these procedures makes it almost impossible to draw any satisfactory conclusions. The real therapy of the condition must await the identification of the mechanism for the attacks. At

present therapy in the acute attack is directed toward the relief of what appear to be vascular crises. The treatment during the interval should be directed toward the rectification of any abnormal tendencies in the individual. At present, our efforts at the clinic are being directed along the lines of organotherapy. Our investigations have shown a definitely altered condition of hormonal balance. Our therapy consists of the use of theelin, either as vaginal suppositories or by hypodermic injections. The results of therapy are encouraging and will be fully reported at some later date.

The list of references used in the preparation of this article can be found in the Bulletin of the Neurological Institute Vol. II. No. 3, November 1932.

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PROCEEDINGS OF ACADEMY MEETINGS

NOVEMBER

STATED MEETINGS

Thursday Evening, November 3

ORDER

- I. EXECUTIVE SESSION at 8:30 o'clock
 - a. Report of the Nominating Committee
Nominations: for President for two years; for one Vice-President for three years; for two Trustees for five years; for four members of the Committee on Admission for three years, and for one member of the Committee on Library for five years
 - b. Election of Fellows
 - c. Presentation of Diplomas
- II. THE ANNIVERSARY DISCOURSE at 8:45 o'clock
"Enemies of Society," Walter B. Cannon, Harvard University

THE SECOND HARVEY LECTURE

"SIMILARITIES BETWEEN DISEASES OF THE VEGETABLE KINGDOM AND THOSE OF
MAN AND ANIMALS," L. O. KUNKEL

Head of Division of Plant Pathology, Rockefeller Institute,
Princeton, N. J.

This lecture took the place of the second Stated Meeting of the Academy for November.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY
Tuesday Evening, November 1, at 8:00 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF PATIENTS
 - a. Patients from the clinic of the New York Post Graduate Medical School
 - b. Miscellaneous patients
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

JOINT MEETING

SECTION OF NEUROLOGY AND PSYCHIATRY
and

NEW YORK NEUROLOGICAL SOCIETY
Tuesday Evening, November 1, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. CASE REPORT
Clinical examples of the expression of instinctual conflicts through symptoms and speech, Lawrence S. Kubie

III. PAPERS OF THE EVENING

- a. Mental symptoms in cases of brain tumors with psychoses, George W. Henry, Gerald R. Jameison
 - b. Mental disease
 1. The Neurologist's point of view, Israel S. Wechsler
 2. The Psychiatrist's point of view, Bernard Glueck
- Discussion, B. Sachs, Smith Ely Jelliffe, Israel Strauss, J. Ramsay Hunt, Foster Kennedy, Louis Casamajor

JOINT MEETING
SECTION OF SURGERY
and

NEW YORK PATHOLOGICAL SOCIETY
Friday Evening, November 4, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. Pathological aspect of tumors of the thyroid, Allen Graham (by invitation)
Discussion, David Marine, Lawrence W. Smith
- b. Malignant tumors of the thyroid, Guilford S. Dudley
Discussion, Russel H. Patterson, J. William Hinton

II. GENERAL DISCUSSION

SECTION OF HISTORICAL AND CULTURAL MEDICINE
Wednesday Evening, November 9, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. The emblem of Greek medicine (with lantern slides),
C. N. B. Camac
- b. Gaspar Taliacotius, sixteenth century plastic surgeon (with lantern slides), Jerome P. Webster

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF PEDIATRICS

Thursday Evening, November 10, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

Symposium on Lung Abscess and its Pleural Complications

- a. Pathology and pathogenesis, Coleman B. Rabin (by invitation)
- b. Clinical features, Harry Wessler (by invitation)
- c. Bronchography—the broncho-pulmonary segments in localization of abscess, A. Glass (by invitation)
- d. Bronchoscopy, Rudolph Kramer
- e. Surgical treatment, Harold Neuhof

SECTION OF MEDICINE

Tuesday Evening, November 15, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. The pathology of catarrhal jaundice and hepatitis, Paul Klemperer
 - b. Diagnostic importance of biliary crystals in duodenal contents, Henry A. Rafsky
 - c. The clinical usefulness of tests for hepatic functions, Carl H. Greene (by invitation)
 - d. Treatment of a sick liver, Chester M. Jones, Massachusetts General Hospital (by invitation)
- III. GENERAL DISCUSSION
 - Louis Rousselot (by invitation), Reuben Ottenberg, Allen O. Whipple, Max Einhorn

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, November 16, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF APPARATUS
 - A cysto-urography table, J. Sydney Ritter
- III. PRESENTATION OF PAPERS
 - a. Diethane—a new local anaesthetic, Clarence G. Bandler
 - b. Important psychic manifestations of prostatism, John Duff
 Discussion opened by, L. Beverley Chaney
- IV. PAPER OF THE EVENING
 - Conservative surgery of the kidney, Thomas C. Stellwagen, Philadelphia (by invitation)
 - Discussion, Edwin Beer
- V. GENERAL DISCUSSION

JOINT MEETING

SECTION OF OTOLARYNGOLOGY

and

SECTION OF OTOLARYNGOLOGY

of the COLLEGE OF PHYSICIANS AND SURGEONS OF PHILADELPHIA
held at the

COLLEGE OF PHYSICIANS BUILDING

22 Street above Chestnut, Philadelphia

Wednesday Evening, November 16, at 8:30 o'clock

ORDER

- I. PAPERS OF THE EVENING
 - a. Postoperative pulmonary complications. Are they preventable? Chevalier Jackson
 - Discussion, John D. Kernan
 - b. Atresia of the choanae: its incidence, types and cause, J. Parson Schaeffer
 - Discussion, E. Ross Faulkner
 - c. Discussion on recent developments as to otosclerosis, cholesteatoma and static labyrinth function, George M. Coates

Discussion, Samuel J. Kopetzky

- d. Discussion on some phases of the anatomy of the temporal bone,
O. V. Batson

Discussion, Marvin F. Jones

The members of the New York Section were cordially invited to be the guests of the Philadelphia Section at dinner at the Rittenhouse Hotel, 22nd and Chestnut Streets, Philadelphia, at 6:30 p.m.

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, November 18, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. The removal of vertebral bodies in the treatment of scoliosis,
Alan DeForest Smith
 - b. An operation for the relief of congenital elevation of the scapula
or paralysis of the serratus magnus muscle, Armitage Whitman
 - c. A visit to the clinic of Dr. Locke, Williamsburg, Ontario, Frederick
J. Matthews
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY

Monday Evening, November 21, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. A case of lagophthalmos relieved by a new method, I. Goldstein,
5 minutes
 - b. A case of nodular corneal opacity (Groenouw), W. L. Hughes
5 minutes
- III. PAPERS OF THE EVENING
 - a. Remarks on the technique of fitting contact glasses, LeGrand H.
Hardy, 5 minutes
 - b. Demonstration of lantern slides illustrating sclerosis of the basal
vessels of the brain, Arnold Knapp, 15 minutes
 - c. Roentgentherapy of pituitary tumors, Clarence C. Hare (by invi-
tation), Cornelius G. Dyke, 20 minutes

Discussion, Charles A. Elsberg, Thomas H. Johnson, Maurice Lenz
- IV. There will be shown during the demonstration period (7 to 8:30)
 - a. A collection of contact glasses
 - b. Patients wearing contact glasses, presented by Clyde E. McDonald,
W. S. Knighton (by invitation), A. E. Towne (by invitation)
 - c. Slit lamp cases by M. L. Berliner, G. Bonaccolto (by invitation),
I. Goldstein, W. L. Hughes
 - d. Microscopic specimens of an eye with retinitis pigmentosa, D.
Wexler
 - e. A patient with retinitis pigmentosa sine pigmento, D. Wexler

NOTICE

The December meeting of the Section will be devoted to the presentation of patients with tumors of the eye and orbit and to post operative or post rayed results.

SECTION OF OBSTETRICS AND GYNECOLOGY
Tuesday Evening, November 22, at 8:30 o'clock

ORDER

Program arranged from the Clinic of
THE LONG ISLAND MEDICINE COLLEGE HOSPITAL

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. A case of extra uterine twin pregnancy, William A. Jewett (by invitation)
 - b. A case of tuberculosis of the breast, Harvey B. Matthews
 - c. A case of leukoplakia with vulvectomy, Morris Glass (by invitation)
- III. PAPERS OF THE EVENING
 - a. End results of plastic operation for prolapsus uteri, Gordon Gibson (by invitation)

Discussion, Frederick C. Holden

 - b. Intravenous glucose for shock, Vincent Mazzola (by invitation)
 - c. Chlorthymol as an antiseptic during labor—a preliminary report, Alfred C. Beck

Discussion, Morris Leff, Frederick C. Holden
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION

New York Meeting
of the

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
under the auspices of
THE NEW YORK ACADEMY OF MEDICINE
Wednesday, November 16, at 8:15 o'clock

- I. Production in Dogs of a Syndrome Similar to Sprue by Diets Deficient in Vitamin B₂, D. K. Miller and C. P. Rhoads
- II. Effect of Viosterol on Excretion of Lead, F. R. Flinn and A. R. Smith
- III. Relation between Vitamin A Potency and the Carotene Content of Green Plant Tissue, W. C. Russell, M. W. Taylor and D. F. Chichester
- IV. Preventing Loss of Weight in the New Born, I. N. Kugelmass
- V. Chemical Differentiation of Nervous and Hormonal Pancreatic Secretion, T. F. Zucker, P. G. Newburger and B. N. Berg
- VI. Bicolor Determination of pH using Standard Dubosq Colorimeter with Light Filter, C. A. Daly (introduced by A. Knudson)
- VII. Note on the Susceptibility of Certain Strains of Hemolytic Streptococcus to a Streptococcus Bacteriophage, R. C. Lancefield (introduced by H. F. Swift)

VIII. Presence of Capsules on Bacterium Granulosis, J. W. Churchman
and N. V. Emelianoff

NEW YORK ROENTGEN SOCIETY

In affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Monday Evening, November 21, at 8:30 o'clock

ORDER

- I. 8:30 to 9:00 o'clock
Demonstration and discussion of interesting cases
- II. 9:00 o'clock
"Early recognition of intraeranian disease," C. Wadsworth Schwartz
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

FELLOWS ELECTED NOVEMBER 3, 1932

Louis F. Bishop, Jr.....	121 East 60th Street
Michael M. Tetelman.....	17 East 38th Street
Harold B. Davidson.....	1070 Park Avenue
Vincenzo Fanoni.....	119 West 11th Street
E. Clarence Kern.....	Montclair, N. J.
Mendel Jacobi.....	876 E. Parkway, Brooklyn
William H. Mencher.....	6 East 96th Street
Timothy J. Riordan.....	853 Seventh Avenue
James Joseph Hayes.....	1 Nevins Street, Brooklyn
Merrill D. Lipsky.....	45 Park Avenue
Ernest E. Arnheim.....	1185 Park Avenue
Walter I. Galland.....	1085 Park Avenue
Hugh S. McKeown.....	30 West 59th Street
Jessie Marmorston-Gottesman.....	2720 Grand Concourse

DEATHS OF FELLOWS OF THE ACADEMY

ROLFE FLOYD, M.D., 19 West 55 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1899; elected a Fellow of the Academy April 1, 1909; died, December 6, 1932. Dr. Floyd was a Fellow of the American Medical Association, a member of the County and State Medical Societies. He had been a member of the attending staffs of the Vanderbilt Clinic and Bellevue Hospital. At the time of his death he was Physician to Roosevelt Hospital. For his war services he received a citation from General Pershing and the Medaille d'Honneur from the French Government.

LEO KESSEL, M.D., 940 Park Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1903; elected a Fellow of the Academy April 1, 1909; died, December 5, 1932. Dr. Kessel was a Fellow of the American Medical Association, a member of the American Society for the Advancement of Science, a member of the County and State Medical Societies, a member of the Society of Associated Alumni of Mt. Sinai Hospital, and Physician to Mt. Sinai Hospital. He was a member of the National Tubercular Association, the Society for Clinical Investigation, and had contributed to many medical journals articles on heart disease, pneumonia, arthritis, the thyroid gland, tuberculosis and exophthalmic goitre.

EDWARD AMBROSE KING, M.D., 115 East 61 Street, New York City; graduated in medicine from the University of Pennsylvania, Philadelphia, Pa., in 1912; elected a Fellow of the Academy October 2, 1919; died, December 9, 1932. Dr. King was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the Society of Associated Alumni of St. Vincent's Hospital and Surgeon to the same Hospital, also Surgeon to the Foundling Hospital, New York. He was Consulting Surgeon to St. Joseph's Hospital, Yonkers and Assistant Surgeon to Misericordia Hospital, New York.

WILLIAM SYDNEY THAYER, M.D., 1208 Eutaw Place, Baltimore, Maryland; graduated in medicine from Harvard University, Boston, Mass., in 1889; elected an Honorary Fellow of the Academy November 18, 1926; died, December 10, 1932. He was former president of the American Medical Association, having been elected in 1927, also a member of the American Society of Tropical Medicine, of which he was president in 1910, and held honorary degrees from several Universities. Sir William Osler, first Professor of Medicine at Johns Hopkins University School of Medicine had Dr. Thayer as his Chief Assistant. Later he was to fill the post that Dr. Osler held as Physician in Chief to Johns Hopkins Hospital. Had Dr. Thayer lived two more years he would have been honored throughout the world. His colleagues and former students had planned an international celebration of his seventieth birthday June, 1934.

FENTON BENEDICT TURCK, M.D., 14 East 53 Street, New York City; graduated in medicine from Northwestern University, Chicago, in 1891; elected a Fellow of the Academy December 18, 1913; died, November 16, 1932. Dr. Turck was a Fellow of the American Medical Association, a member of the American Gastro-Enterological Association and held teaching appointments in Chicago Philadelphia and New York. A large part of his professional life was devoted to research along pathological and biological lines and he prepared and published a number of books and numerous articles as a result of his investigations.

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Malignant disease of bone has not been treated extensively enough by irradiation to establish any reliable statistics.

Metastatic carcinoma of bone responds to irradiation sometimes brilliantly, and patients with extensive disease may sometimes be kept in comfort and apparent health for five years, but I know of no permanent cures, and generally, one can only hold the disease for about two years.

In osteogenic sarcoma some encouraging results have been obtained, but it seems that early amputation, or according to my experience, preliminary irradiation and then amputation gives the best results.

In giant cell bone tumors very satisfactory results have been obtained. While it requires from one to five or more years for recalcification, the function of the extremity is retained throughout the treatment, or is soon restored. A spontaneous or traumatic fracture is no contra-indication to the treatment, and we therefore believe irradiation to be the best available treatment.

In the malignancies of the alimentary canal very little has been accomplished by irradiation. A few scattered cases seem to have been cured, but certainly there should be no delay in any operable case.

In brain tumors some excellent results have been obtained in the irradiation of the sellar adenomas, but elsewhere, our results have been mostly palliative.

I have omitted from this brief summary all reference to etiology, diagnosis or technique, all of which are very important. As our equipment and technique improve, and the public have eliminated the fear of operation, and learn the importance of early treatment, our statistical results will surely improve.

MIGRAINE AND ITS TREATMENT

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Migraine, or "sick headache," as it is often called may be defined as a recurrent headache, usually unilateral, often incapacitating in severity, culminating in nausea or vomiting, frequently accompanied by evidences of disturbance in various parts of the brain, occurring against a background of relatively good health and associated with a familial history of headache, convulsions or other paroxysmal disorders. While this definition is quite satisfactory for the great majority of cases, it need not be considered as an absolutely rigid one since many deviations from these criteria may occur. A gradual broadening of the concept of migraine has taken place during the last twenty years introducing a considerable degree of elasticity into the limitations of the disorder. This has resulted in the grouping together of a considerable number of signs and symptoms as a symptom-complex called migraine. No case will present all of the symptoms and signs of this syndrome and one or more of the important cardinal manifestations may fail to appear. On account of the significant grouping of subordinate evidences of disturbance the absence of important symptoms need not invalidate the diagnosis of migraine and even the cardinal symptom, headache, may be insignificant or absent.

The diagnosis of migraine requires a thorough physical examination and in many instances comprehensive study by all the available means of laboratory diagnosis. Such an examination often demonstrates a physical basis for the symptoms and in such instances, the diagnosis of a symptomatic migraine may be made.

This type of the disorder may be found to depend upon uncorrected refractive errors, sinus diseases, severe secon-

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